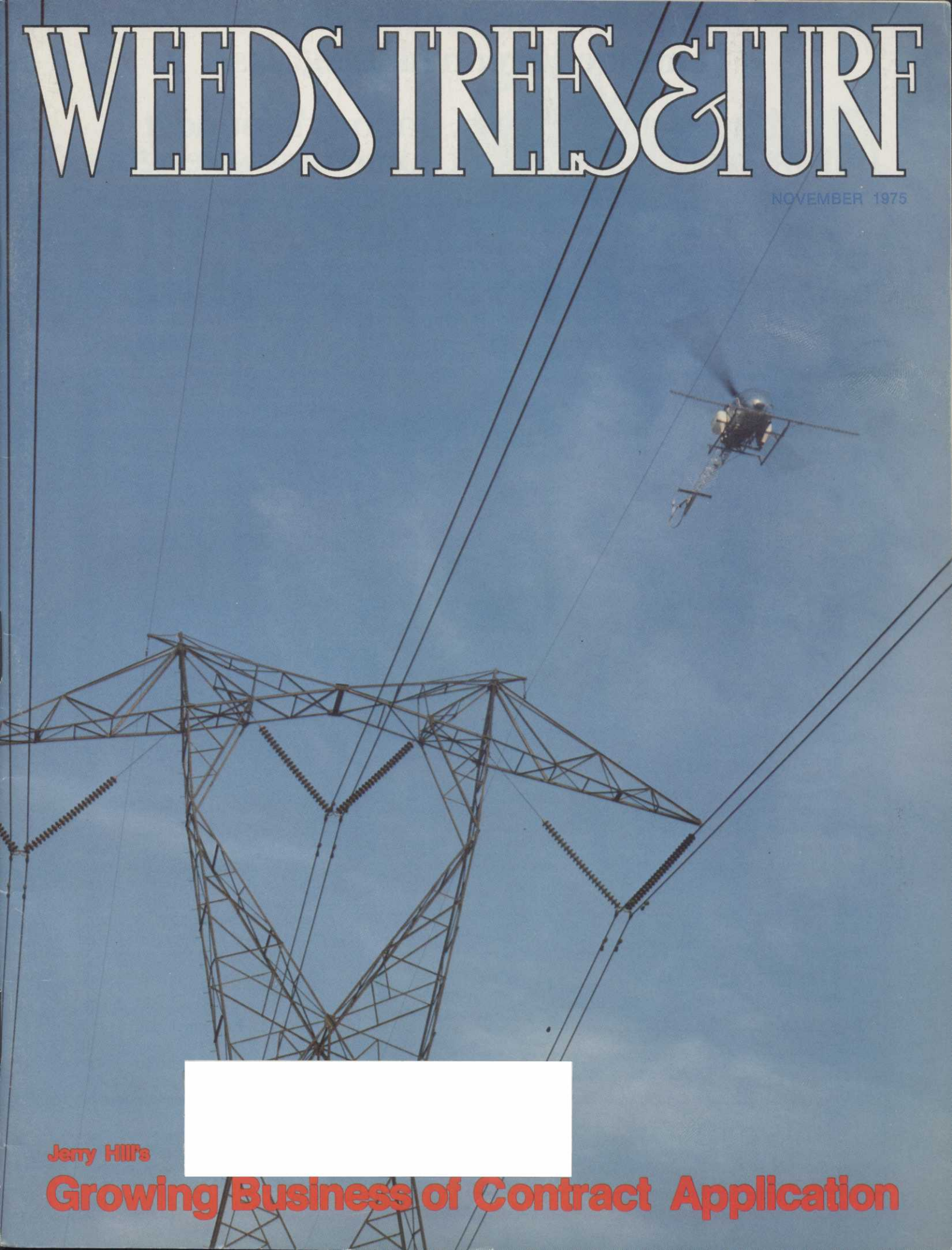
WEEDS TREES & TURF

NOVEMBER 1975



Jerry Hill's

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Pennfine Perennial Ryegrass.

If it's got a weakness, nobody's found it. But we have heard about some new strengths.

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Now, after thousands of grounds maintenance pros have used Pennfine, nobody's reported a real weakness. All the characteristics the Penn State agronomists selected for—unsurpassed mowability, excellent disease resistance, exceptional decumbency, persistence under diverse management conditions, fine texture and compatibility with Kentucky Bluegrass — have proven out in the real world. That's the ultimate test.

Dr. Joe Duich of Penn State inspecting a new application for Pennfine: Independence National Historical Park, Philadelphia.

In fact, Pennfine has performed even better in some areas than anticipated. It's proven to be more tolerant to both shade and heat. It's shown excellent rust resistance on the West Coast. And, although Pennfine showed good to excellent disease tolerance in university trials, its disease tolerance appears to be even stronger in actual use.

Pennfine production fields in the Pacific Northwest where a major effort is underway to meet growing demand for seed.

Increased production.

From the very beginning, there's been only one problem with Pennfine: not enough seed to meet demand. And that problem is just about solved with substantially increased production. We can't make you a flat promise. But, if you order fairly soon, you should be able to get Pennfine seed in the quantity you want.

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Either way, whether you seed Pennfine this year or just test it, we think you'll be impressed by the results.

WTT-11

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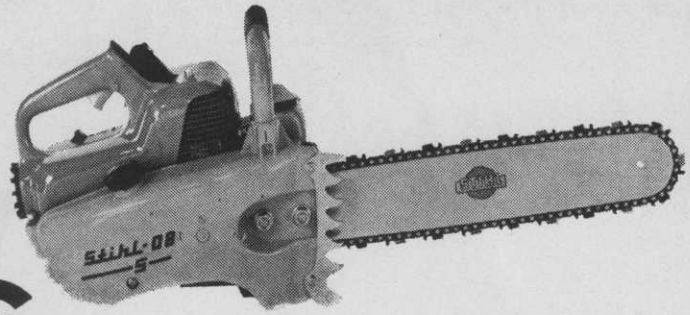

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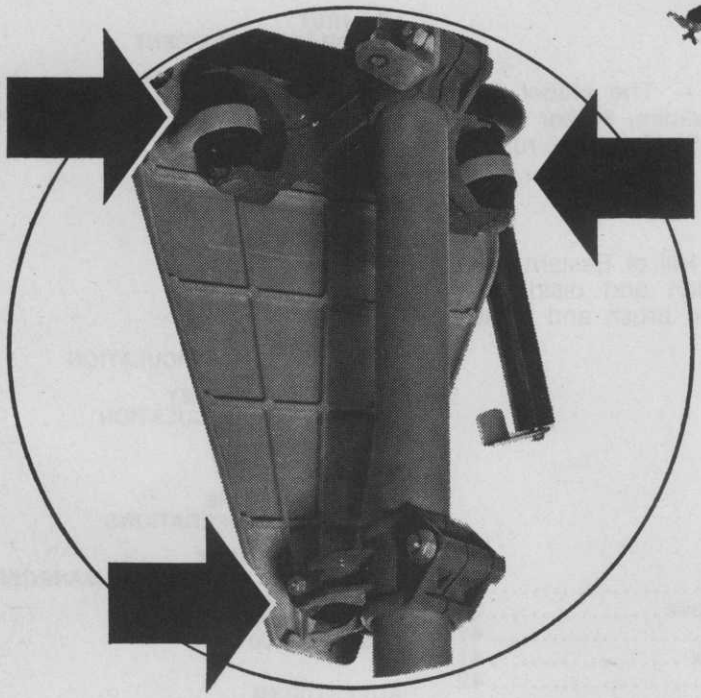

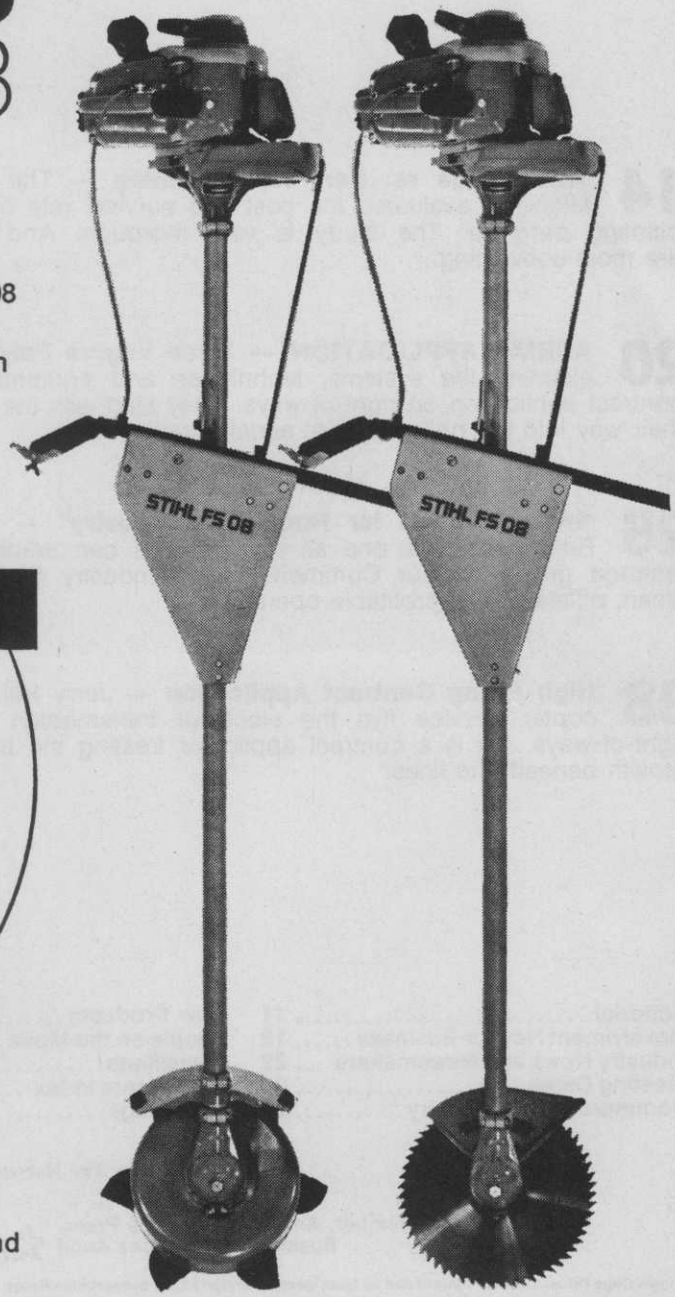

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WEEDS TREES & TURF®

November 1975, Vol. 14, No. 11

14 **Tree Spade vs. Bare Root Planting** — The City of Lansing, Michigan evaluated the cost and survival rate of their street tree planting program. The study is very thorough. And the conclusions are most convincing.

20 **AERIAL APPLICATION** — Three Virginia Polytechnic scientists examine the systems, techniques and equipment of helicopter contract application on right-of-ways. They start with the basics and work their way into the philosophy of aerial spraying.

26 **"Instant Lawns for Home and Industry"** — The Huber Sod Ranch motto is one all sod growers can admire. Huber is the featured grower in our Commercial Sod Industry Section. He runs a clean, efficient, and profitable operation.

38 **High Flying Contract Application** — Jerry Hill of Eastern Helicopter Service flys the electrical transmission and distribution right-of-ways. He is a contract applicator treating the brush and woody growth beneath the lines.

Editorial 11
Government News • Business 12
Industry News and Newsmakers ... 22
Meeting Dates 24
Commercial Sod Industry 26
New Products 28
People on the Move 31
Classifieds 41
Advertisers Index 41
Trimmings 42

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THE COVER — Jerry Hill flys his ship down a distribution line applying chemical to the vegetation. His ship sports a Microfoil boom and .060 nozzle arrangement manufactured by Amchem.

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Each chemical has its unique qualities and different effects in weedkill. But each also is limited so that none of the three chemicals, alone, can deliver the all-round versatility essential to a total, professional turf program. The reach of each chemical is too limited.

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Such multiplication of effect from combined ingredients is called synergism.

TRIMEC herbicides are synergistic. Thus, surprisingly light applications to turf pack a deadly wallop to broadleaf enemies.

Now, these three proven chemicals have been carefully reacted and balanced together, inseparably, to form a new and far superior herbicide . . . TRIMEC.

is Four ways better:

safely controls all weeds, works even in cool weather.

The name is TRIMEC.

Read on to learn why TRIMEC is the best broadleaf herbicide you can buy:

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No other herbicide is so totally reliable in destroying the wide spectrum of broadleaf weeds.

The fact is, we have yet to discover a broadleaf weed that can resist TRIMEC'S lethal punch.

Normally, this escape-proof herbicide completely kills actively growing weeds with one application, correctly timed and applied. The result is positive and definite — turf thrives in weed-free abundance.

2) TRIMEC is safe

It's the safest herbicide available for grasses, because of the small amounts of both 2,4-D and dicamba. And because the recommended dosages are so light, there is no significant root uptake. Consequently, TRIMEC does not harm flowers, trees and shrubs.

Thus while TRIMEC is deadly to weeds, it is gentle and harmless with grasses, flowers, trees and shrubs, when properly applied.

More, TRIMEC is friendly to the environment. The small dosages required put less chemical into the soil. And, because all components are biodegradable, they are soon rendered harmless by natural soil organisms.

3) TRIMEC herbicides cost less

Although the cost-per-gallon may be as much or more than other herbicides, **the actual cost-per-acre** of weed control is substantially less. Smaller amounts of chemicals just naturally reduce the cost. Additional economy results from its effectiveness, which almost always eliminates the need for repeated applications, which saves labor and equipment costs.

TRIMEC's **effective** cost is the lowest of all broadleaf herbicides.

TRIMEC® is a registered trademark of PBI-GORDON Corporation, U.S. Patent No. 3,284,186.

4) Cool-weather wallop

TRIMEC herbicides work well in late autumn or early winter, when temperatures are in the fifties. This gives you a tremendous advantage.

At last, you can destroy promptly those late-starting dandelions, plantains, chickweeds, etc. that sprout **after** your summer spraying.

Going into winter with a clean turf has a great **spring** benefit — you needn't spray so early for dandelions that you miss most of the later-starting weed crop.

No longer are weeds in control. Now you're in command, planning your work and working your plan to nip weeds at the correct time, in any season.

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TRIMEC is available in a special Bentgrass formula made especially for Bentgrass, and other grasses sensitive to higher rates of 2,4-D.

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Superintendent
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"Trimec is the most effective and economical broadleaf herbicide a sod grower can use."
Lyle Reiss
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"We want immaculate, weed-free turf . . . Trimec delivers it."
Carl Ripper
Resthaven Cemetery
West Des Moines, Iowa

Why fall is the best time to "TRIMEC" dandelions

TRIMEC's cool-weather wallop lets you destroy them with one treatment in late autumn or early winter, when temperatures have cooled to the 50s range.

This gets the latecomers — any weeds that sprout after your summer spraying. The advantages are obvious.

By going into winter with a weed-free turf, you can spray *later* next spring, when the *late-starting* weeds are coming on. You won't have to spray *early* just to knock out the blooming dandelions!

This is your *first step* toward total control with TRIMEC — the best herbicide available.

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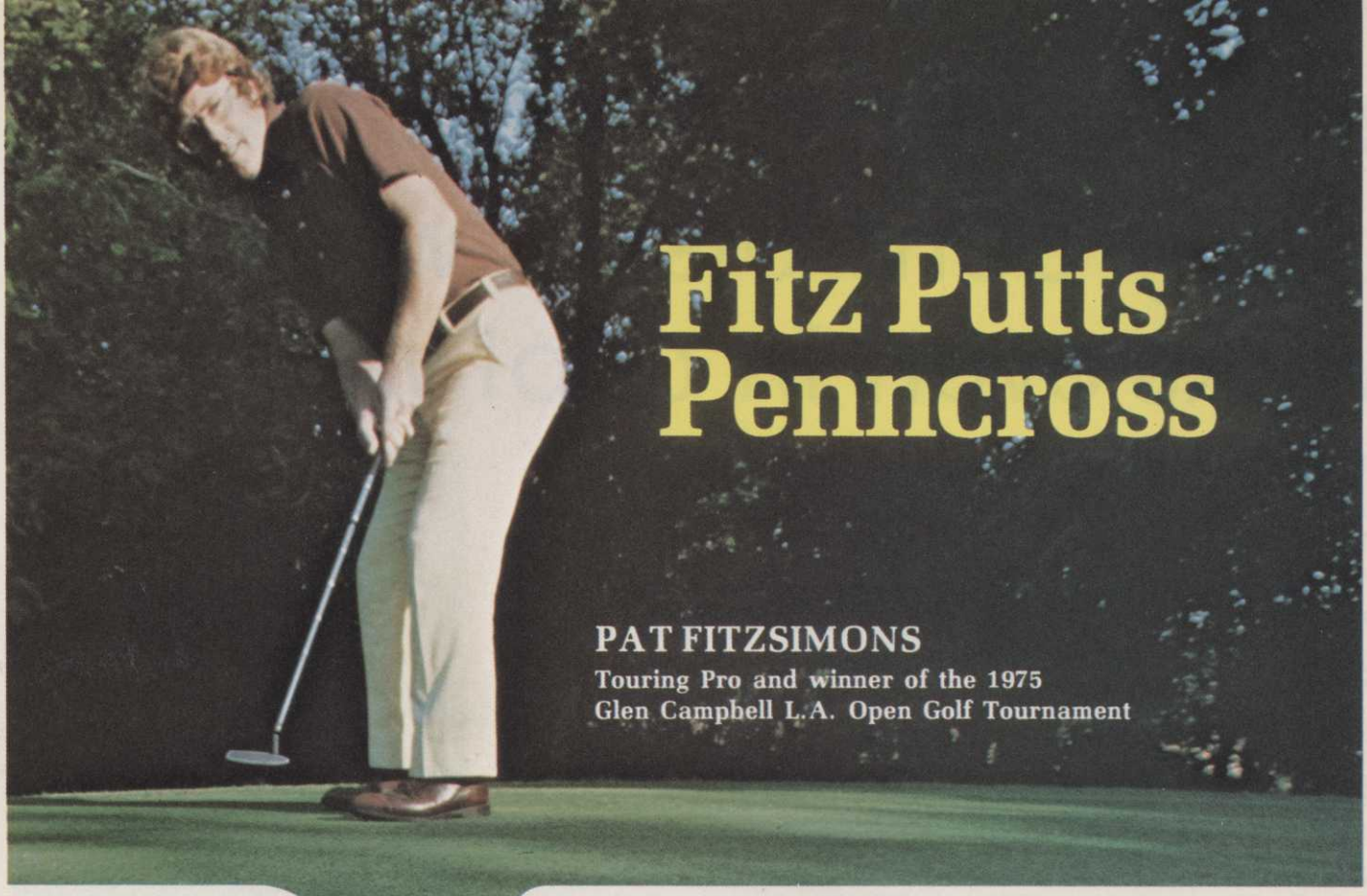

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Editorial

EPA. The very idea that any Federal agency could think themselves so indispensable and ubiquitous as the telephone evokes an array of emotions — all negative. Well, the worm has finally turned. And a Congressman from Idaho, Steve Symms, has initiated actions to put an end to the Agency.

Symms introduced legislation in the House calling for the abolishment of EPA. The Bill, HR-9819, was referred to the Government Operations Committee where it remains tied-up in some elections year tactics.

Symms is a member of the House Agricultural Committee whose task it is to look into EPA's Federal Environmental Pesticide Control Act of 1972. For several months, Symms and the Committee found EPA officials "arrogant and impossible to work with". "After weeks of negotiations, they (EPA) wouldn't agree to even the simplest compromise," he said. It was then Symms decided his office had to take action.

"My office is through trying to talk common sense with EPA bureaucrats," Symms said. He and his staff developed the Bill. And with no co-sponsors, he introduced it to Congress.

"Once people learned of our Bill, we began receiving inquiries from businessmen and trade organizations asking how they could help," he said. One of Symms staff members says she receives some 30-50 letters per day in favor of the proposed legislation.

But Symms is bucking some stiff odds. No other federal agency was ever abolished because their control got out of the system of checks and balances. However, nothing from Capital Hill would surprise us.

Symms predicts legislative action will begin sometime after the first of the year. If the Bill should go so far as to require public hearings, you can bet on some far ranging support. In fact, the Departments of Commerce and Transportation are now questioning EPA legislation and may take similar action in the near future.

We do not feel any successful legislation against EPA would destroy the environment. Nor do we feel that a central agency should control affairs falling under the jurisdiction of a dozen other U. S. departments.

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Government News·Business

National movement to abolish EPA is being headed by Idaho Congressman, Steve Symms. His office referred Bill HR-9819 to the Congressional Governmental Operations Committee on September 24, 1975. The Bill asks for abolishment of EPA and a realocation of all EPA programs back to the original federal agencies. EPA programs would be returned to the jurisdiction of USDA, Departments of Transportation and Interior, and HEW. The Bill's final provision calls for review and revision of all EPA legislation. Symms said his office is through trying to talk common sense with EPA bureaucrats. "I can only conclude that we have finally created an agency whose power is running out of the control of any Constitutional branch of the government," he said.

Weed Eaters, Inc., has moved its distribution center and other operations to 36,580 square feet of the new Beltway Service Center in west Houston. The company has also expanded its molding shop to occupy the approximate 6,000 square feet of space that became available in Windsor Plaza because of the move to the Beltway. Weed Eaters' Beltway office is located at 10515 Harwin Dr., Suite 138, Houston, Texas 77027.

Congress indicated some dissatisfaction with the Federal Environmental Pesticide Control Act of 1972 by not extending FIFRA for three years as requested in July. Instead, a 90-day extension until September was granted. Now, another 90-day extension has been proposed, until December 31, 1975, to enable additional review of EPA's activities. Presently several amendments under consideration would place specific restrictions on EPA.

Century/Rain-Aid Supply Corp. is the new franchised turf distributor for Rain Bird sprinkler equipment serving the greater Chicago area, northern Illinois and northwest Indiana markets. Sources claim this is one of the fastest growing irrigation markets in the U. S.

EPA boss, Russell E. Train, has established an Administrator's Pesticide Policy Advisory Committee. Train said the move is designed to better "articulate the objectives of the pesticides program and the basis on which decisions are made. There is also need to facilitate the input of outside groups in these matters."

Federal Power Commission is considering the decontrol of natural gas. Allocation priorities are established by law and accord highest priority to human needs. As a consequence, shortages must be borne by business. Pending Senate action is S-692 (Hollings, D-S.C.) which would establish higher rates at the well-head for new gas and thus encourage increased exploration and drilling. Bill would also extend Power Commission control to intrastate market, reserve low cost gas for residential users, allocate higher cost gas (new, synthetic natural and liquified natural) to industrial users, and prohibit all boiler uses of natural gas.

EPA has also released a public opinion poll entitled, "Public Attitudes Toward Environmental Tradeoffs." EPA claims the survey reaches several conclusions useful in examining environmental issues. The poll was completed and released by the Opinion Research Corporation. EPA reports no involvement in the preparation or financing of the poll but Opinion Research has given the Agency permission to reproduce and distribute.

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Lansing Street Trees

Tree Spade vs. Bare Root Planting

By ROBERT A. COOL, Assistant Superintendent, Forestry Division, Lansing, MI.

BARE ROOT planting of street trees has been the standard method utilized by the Lansing Forestry Division and most other cities. This premise was seemingly well founded on the concept of low cost, ease of handling, availability of trees, quantity planting in a short time and minimum personnel training.

In 1969 the City of Lansing purchased a Vermeer TS44A trailer-mounted tree spade, one of the first in Michigan. This machine was successfully used for planting larger trees in parks, golf courses and cemeteries. Because the cost of the operation had not been determined, street trees were not planted by this method and it was believed that it would be an expensive luxury for a limited number of residents.

Trouble with the axle of this early model tree spade (since corrected) caused the City of Lansing in 1972 to trade-in the TS44A for a TS44T, a truck mounted model, utilizing the same four-wheel-drive truck. The shorter overall length made street tree planting easier and an increased number of larger street trees were planted. But we were still restricted to replacements of auto, vandal, and gas caused tree losses or where the expenses were paid for the larger-than-normal size tree by the adjacent property owner.

Most of the trees planted during the first four years of operation originated from wholesale nursery block purchases of trees which had grown over salable size, or had been wounded or scarred by nursery equipment, or were salvaged from road and building construction areas. A small percent were taken from Lansing's bare root nurseries. Tree purchases were made for one dollar and later for two dollars per tree for both deciduous trees. The most recent purchase in 1973 found the price per tree at $7.46 for three-inch average diameter trees. This increase in price was created by a large number of private landscapers operating Vermeer tree spades in the area. The "oversize" trees are now in great demand with most being planted privately in new multiple dwelling areas.

As a result of the low procurement cost, the success of operation of the tree spade, and the suspicion of high bare root mortality, Lansing began a study to examine the current cost of the bare root planting program and to determine the feasibility of converting from bare root to tree spade planting on the streets. Using data accumulated for the preceding nine years, the study showed a survival rate for bare root planted trees at only 59%. Of the 41% bare root mortality, vandalism and auto loss was less than 10%. While this figure caused a renewed effort to reduce the mortality of bare root planted trees, it presented a target cost to compare with the cost of the tree spade method which had a total mortality rate of less than 5%.

Table 1. Percentage of tree deaths from major causes by Planting Method

Major Cause of Tree Death	% Dead by Planting Method Bare Root	Tree Spade
Root Failure — Good Site	93%	7%
Borers	92%	8%
Canker	82%	18%
Lack of Water	75%	25%
Vandalism	100%	0%
Other Causes	88%	12%

The total cost for each planting method was calculated to determine the "cost per surviving tree". The calculations included costs for tree procurement, equipment, supplies and labor for "all activities" necessary to obtain a surviving tree. These activities included the simple act of planting the tree in the ground, office and nursery preparation time, record keeping, wrapping, staking, watering and tree removal for non-survivors.

The results of these calculations showed a shocking total cost of $77.10 for "surviving" bare root trees and only $30.45 for "surviving" tree spade trees. It was concluded that 2.53 surviving tree spade trees could be planted at the same cost as a single surviving bare root tree. This cost savings was attributed to:

1) the low cost of handling and preparing a tree spade tree for moving;
2) the high rate of survival achieved in tree spade planting vs. bare root method; and
3) the low maintenance costs after planting.

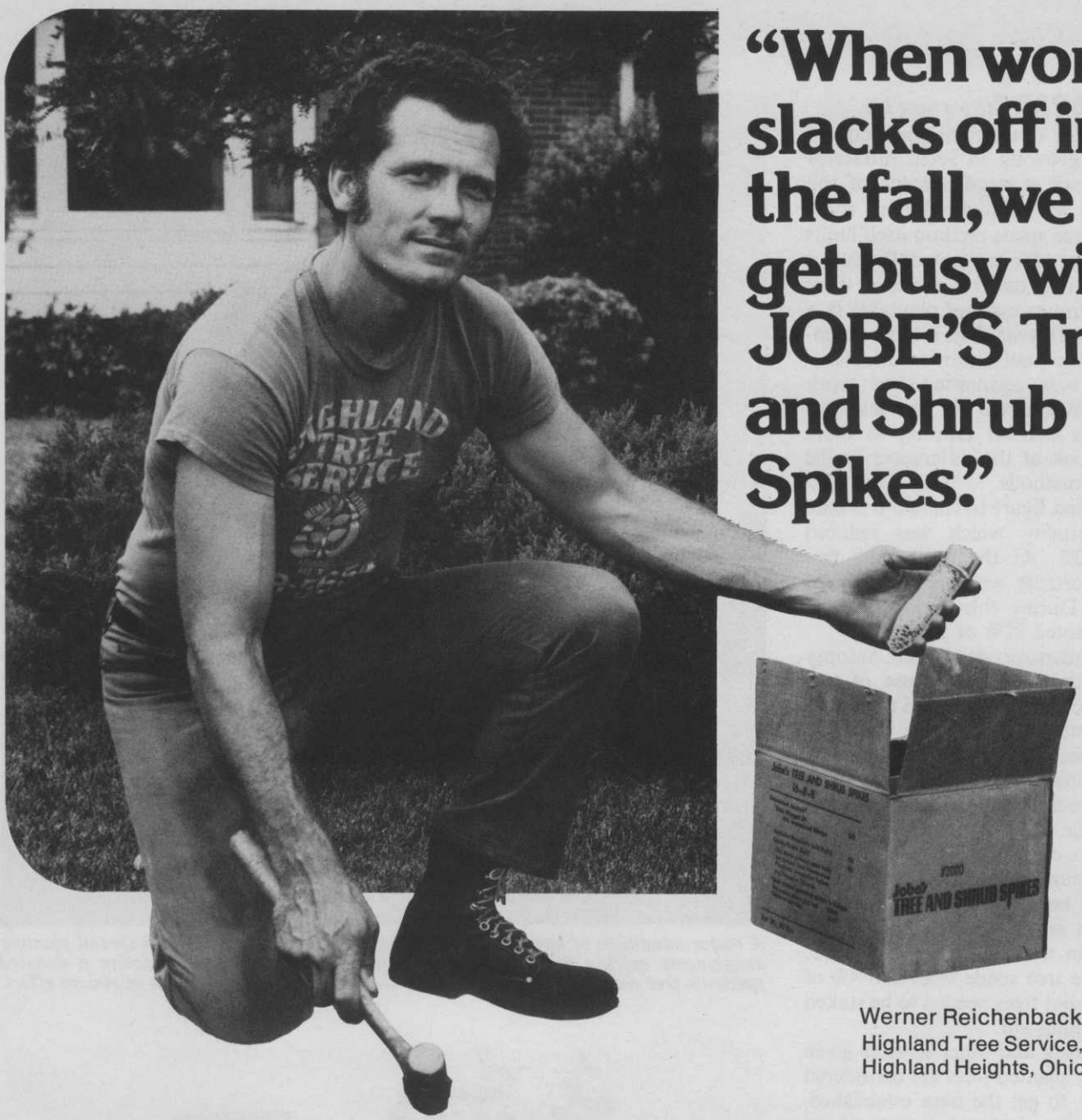
The 1973 study further concluded that the existing backlog of 4,500 street trees yet to plant in Lansing could be done at a cost savings of nearly $210,000.00 by using the tree spade ($137,025.00) instead of the bare root method ($346,950.00).

As a result of this study the Lansing Forestry Division started major street tree planting with the Vermeer TS44T in September, 1973. During the following two years intensive cost accounting was performed on all planting operations to further refine unit costs.

It was immediately determined that not all sites could be planted with the tree spade. Underground utility locating was the first requirement. This activity performed at no direct cost by the local utility and now mandatory by state law has the purpose of avoiding utility breakage and subsequent repair costs, avoiding interruption of customer services, and most important, avoiding the hazard to workers and customers resulting from utility breakage. It is estimated that 10% of all sites had to be planted bare root due to unavoidable conflict. The City of Lansing found another important reason for having underground utilities located which applies to both planting methods. By knowing the utility locations the planting location can be moved as far away as possible from the utilities. Far too many trees are lost or injured by utility repairs within the root area. In addition, the utility companies are very cooperative in this massive locating activity just so future encounters with tree roots can be minimized.

(continued on following page)

"When work slacks off in the fall, we get busy with JOBE'S Tree and Shrub Spikes."



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"I think it's smart two ways to feed trees in the fall. It's good fill-in work for my crew, and it's the best time for the trees. Roots grow in late fall and early winter. That's the time to provide nourishment to help trees survive rough winter weather and have a reservoir of plant food for good growth next spring.

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TREE SPADE *(from page 14)*

The lack of the right kind and size of trees growing in local nurseries also caused a large percent of the locations to be planted bare root.

The tree spade method itself limits the number of trees planted. Because it can plant only one tree at a time, there is a maximum number plantable in a normal work year. This is most dependent on the haul distance variable.

The cost accounting and work records maintained for the last two years has enabled Lansing to more closely look at the differences in the planting methods.

The first figure to stand out is bare root mortality which was reduced below 30%. At the same time tree spade mortality was only 1% for all reasons. During this period the tree spade planted 32% of the trees.

An intensive dead tree autopsy showed that for each cause of tree death, the bare root planted trees were lost at much higher rates than tree spade trees.

Wrapping costs remained the same as the planting method is not the variable, while kind of tree planted does affect this cost.

The number of trees staked were found to be much less than the 20% estimated in 1973. Of the 1,523 trees planted in the fiscal year 1974-1975, 6% of the tree spade trees and 4% of the bare root trees needed to be staked as a planting aid.

Watering and other services given the newly planted trees are considered necessary to get the trees established, therefore is calculated as part of the overall planting cost. It was found that the tree spade trees required at least 10% less of this activity than the bare root trees, saving $0.30 off the average $3.00 bare root maintenance cost each year.

The 1973-1974 wage and equipment figures for bare root planting showed a cost of $21.50 per tree and a tree spade cost of $29.00 per tree before the 28% bare root and 1% tree spade mortality is considered. The actual planting operation cost corrected for mortality gives $29.86 for a surviving bare root tree and $29.29 for a surviving tree spade tree. This figure appears to contradict the 1973 prediction until the tree procurement cost for "surviving" trees is added to the bare root cost ($17.50 corrected to $24.30) and to the tree spade cost ($17.50 cor-

(continued on page 32)

A major advantage of having a tree spade is the capability to perform special planting assignments quickly and cheaply. An instant mini-park or transplanting a donated specimen tree rose to a bicentennial rose bed can be completed with a minimum effort.

Tree spades also come in completely self-contained, trailor mounted units with their own hydraulic system and power plant. But the shorter over-all length of truck-mounted models make street tree planting easier.

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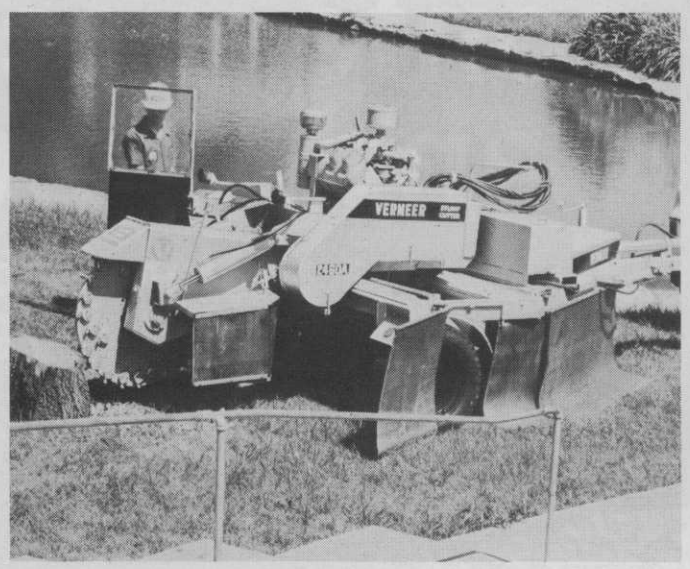

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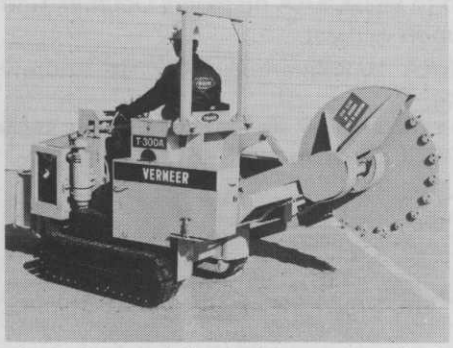

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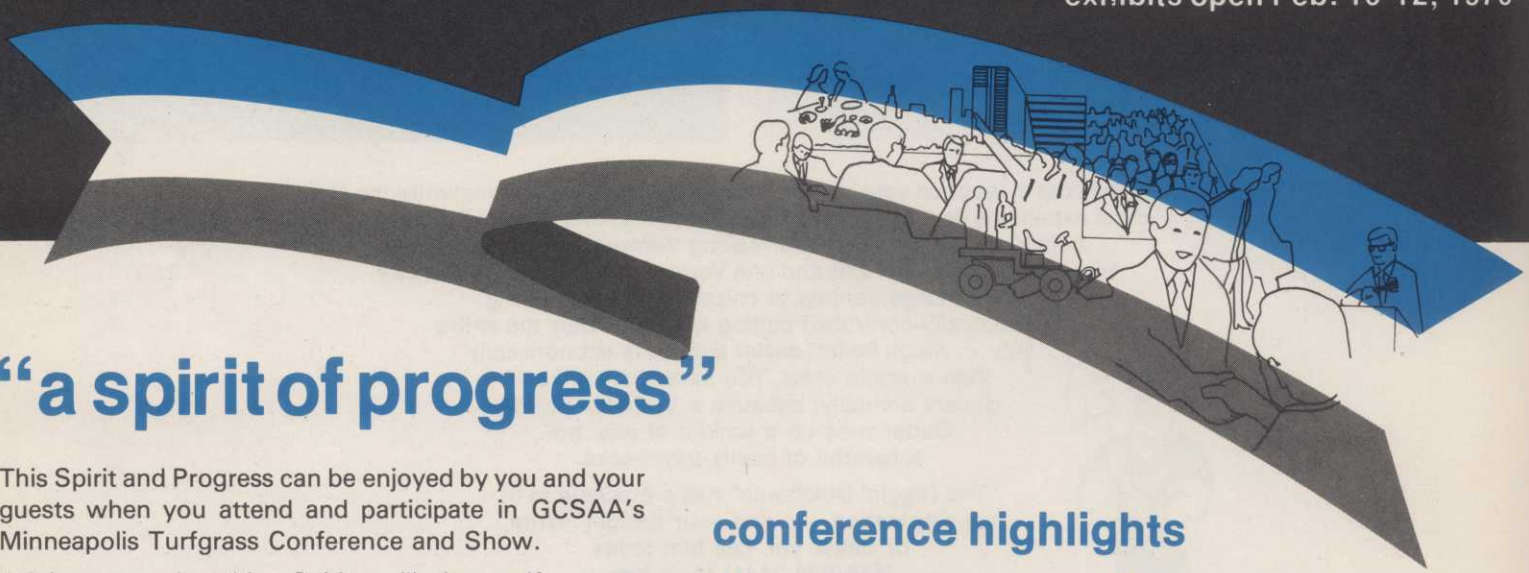

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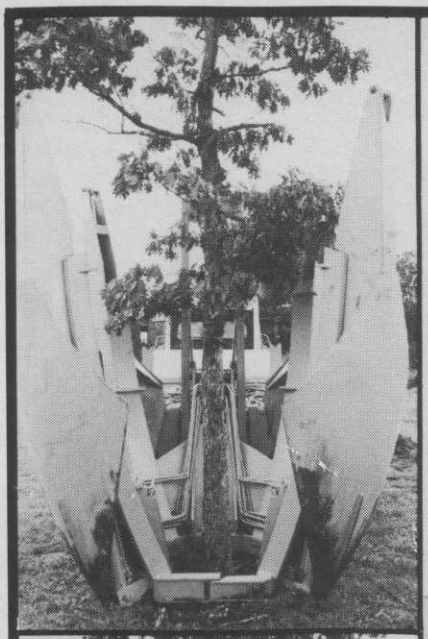

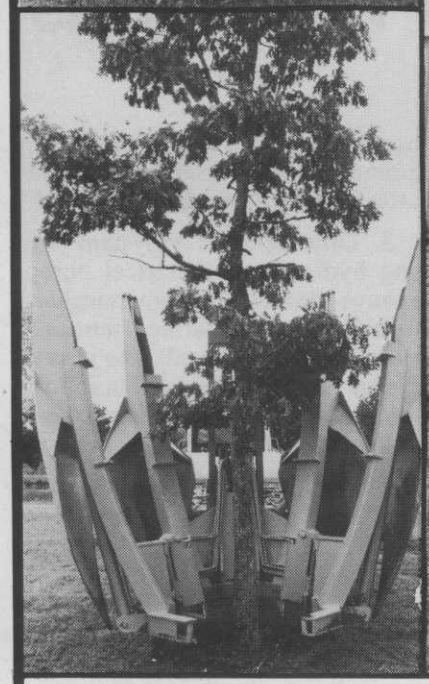

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AERIAL APPLICATION
Techniques, Systems, and Precautions

The following is an excerpt from "Right-of-Way Pest Control: A Training Program for Certification of Right-of-Way Pest Control." Authors for the manual are Virginia Polytechnic Institute scientists; W. E. CHAPPELL, J. S. COARTNEY, and J. A. WEIDHAAS.*

AERIAL application of herbicides to utility rights-of-way is a fast, efficient, economical method of controlling the growth of undesirable woody vegetation.

Since most rights-of-way are restricted in width, and may run through a variety of terrain, it is imperative that the proper equipment and techniques be utilized. Most of the advancement in chemicals and applicator systems has involved the use of a helicopter as the aerial applicating vehicle.

Because of its slow flying characteristics and manuverability, the helicopter readily lends itself to this job. It is capable of flying at or below treetop level, therefore limiting the distance the chemical must fall before reaching the right of way, thereby reducing the possibility of wind drift. The pilot is afforded excellent vision from the helicopter, which further assists in controlling the application.

Aerial Applicating Systems

There are several applicating systems available for right-of-way spraying. Some are designed to handle a thickened material to reduce possible wind drift and resultant off right-of-way damage. But more recent equipment is designed to control drift by delivering uniform large droplets.

1. Amchem Microfoil Boom. A method of applying non-thickened material, and still maintaining control of the chemical. The system consists of a boom with many small nozzles. Low pressure carries the material to the nozzles. The nozzles are trimmed into the airflow and the chemical is laid into the airstream and falls similar to a sheet of rain.

2. Amchem 060. This is a recent adaptation of the microfoil boom. Its name is derived from the orifice size of .060 inches. The large uniform size droplets formed with this nozzle penetrate the leaves of foliage and kills small brush at the ground level. Another advantage of the 060 boom is that more precise control is maintained on the swath which enables the pilot to adequately cover brush growing in ravines under a power line and has proven adequate in drops of 200 ft. or more. The design of the 060 boom practically eliminates fine droplets in the spray pattern when used correctly.

3. Dow R-511. A system utilizing hydraulic or electrical pumps to move the mixture of chemical and Norbak (A particulating agent used to thicken the chemical) into a series of large nozzles. The combination of large orifices, low pressure and thickening agent allow proper control of the material.

4. Conventional Boom. A system utilizing pressure to force chemical through a number of nozzles. The chemical falls to the right-of-way as a mist of various size droplets. The lack of drift control greatly limits the use of a conventional boom.

5. Amchem Spray Disk. This unit is used for the application of Amchem's Envert Emulsion. Properly mixed, the envert material reaches a consistency approximately that of heavily whipped cream. The material is pumped into the tanks of the helicopter and gravity fed to a rotating disk with nozzles. The material is dispensed in large heavy droplets allowing control and placement of the material on the right-of-way.

Aerial Application Techniques

Flying techniques will vary according to the pilot, his experience and capabilities. However, there are several methods or techniques, that if followed, will eliminate off right-

* *Chappell is Professor, Plant Pathology; Coartney is Associate Professor, Plant Pathology; and Weidhaas is Professor, Entomology.*

of-way damage and reduce the number of complaints and damage claims. The following items are considered essential for safe and effective aerial spraying:

1. Reconnaissance of right-of-way — A proper aerial reconnaissance of the right-of-way before spraying will give the pilot advance knowledge of the presence of homes, gardens, valuable crops, trees, or other areas that should not be sprayed. Known restrictions should be marked on right-of-way maps.

2. Observation of wind and other climatological factors, wind speed and direction — Since wind drift of chemical is the major cause of off right-of-way damage, it is very important that the wind speed and direction be known at all times. Wind limits should be set for the chemical being used, application equipment, height of drop, and proximity and species of crops or plants next to right-of-way.

Herbicidal foliage sprays to woody vegetation by aircraft on rights-of-way when the wind velocity exceeds five miles per hour at eye level should be curtailed. In case of deep valleys requiring the chemical to be dropped long distances, it may be necessary to wait for periods when the wind is almost calm. There is also a temperature gradient between hills and valleys which may cause some air movement.

Normally the wind is of lower velocity early in the morning (dawn) and early evening, therefore, most of the production is accomplished during these periods.

3. Continuous observation — The pilot should be constantly observing the spray pattern to see that it does not exceed the edge of the right-of-way and turn on and turn off points are well within limits of the situation. He should be searching for any signs of the presence of valuable property or crops that may have escaped his vision on the advance reconnaissance and be ready to halt spraying at any point.

4. Sensitive crops and other areas — Certain crops such as tobacco, grapes, vegetable gardens should not have the spray applied closer than 100 ft. even under ideal conditions. Never spray toward sensitive crops. These areas should be picked up in reconnaissance or be marked on a map prior to actual spraying.

Homes, parks, recreation areas and the like should be given several hundred feet clearance unless specific instructions to the contrary are given.

Avoid lakes, streams, ponds and other water sites when applying most brush control chemicals. Drainage areas that go into irrigation water should be avoided by at least 500 ft.

Precautions in Aerial Spraying

Regardless of the amount of judgment and caution applied in aerial application, occasional damage claims or complaints may result, legitimate or otherwise.

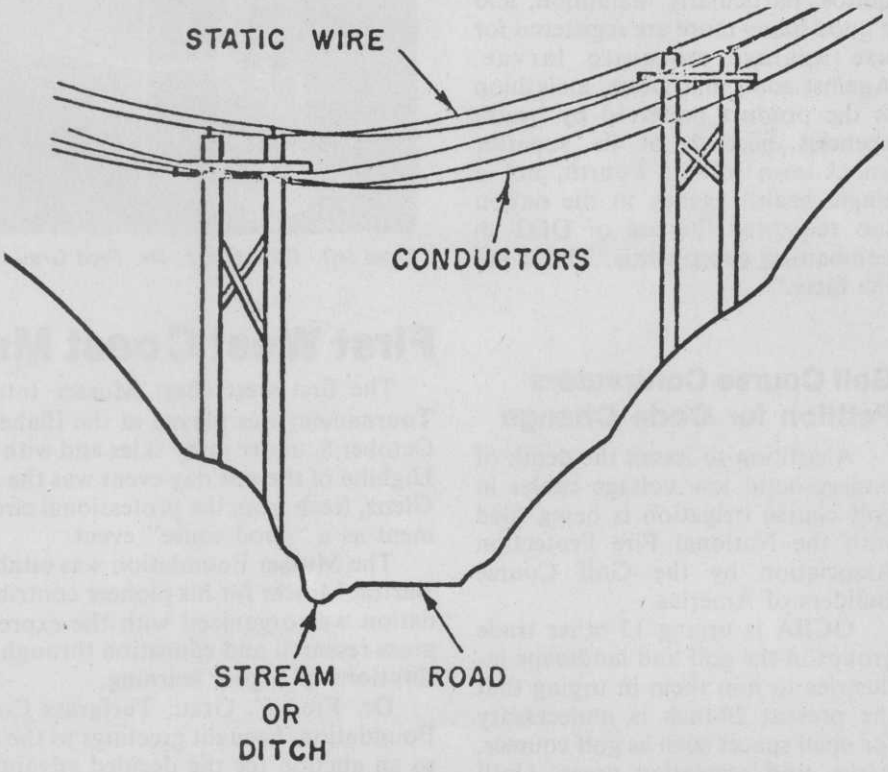
There is no substitute for quick, personal response to these complaints. A rapid investigation of damage complaints can save many dollars in unwarranted claims, and can create good public relations for the rapid settlement of justifiable complaints.

The individual who suffers actual damage deserves fair treatment for his loss. The individual who believes he has been damaged deserves the consideration of a quick response to his complaint and an explanation of the facts.

Even though chemicals and application systems have been continuously improved to make aerial brush control of rights-of-way a practical method of control, with reduced possibility of off right-of-way damage due to wind drift, the equipment is only as good as the pilot that uses it. The pilot is the key to successful application. He must maintain the proper attitude towards aerial applications. He must be constantly aware of the serious problems that could result from improper techniques employed. He must be constantly alert for changes in weather or equipment that could affect the safe application of chemical to the right-of-way limits. Most of all, he must have a sincere desire to do the best possible job.

Due to inaccessible terrain and other factors, aerial application may often be a more practical method of controlling vegetation. However, aerial treatment has no place in urban and suburban areas, and it is very difficult to do aerial appli-

(continued on page 34)



This is a profile of aerial application on a rights-of-way above 40 feet.

Train Asks for Support on Pesticides Issue

Environmental Protection Agency Administrator Russell E. Train called upon environmentalists to "rally together to fight" against current effort in the House of Representatives to weaken EPA authority in the field of pesticide regulation.

In a wide-ranging speech to the American Forestry Congress meeting in Washington on the 100th Anniversary of the American Forestry Association, Train called for a greater delegation of environmental responsibilities to State and local governments and for streamlining Federal Administrative machinery.

Train also attacked as "baseless" recent allegations in Congress and in the press and elsewhere that EPA's 1972 ban on DDT has any responsibility for the current outbreak of encephalitis.

"I have recently read several newspaper editorials which directly suggest that EPA and its 1972 ban on DDT bear major responsibility for the current outbreak of encephalitis—that we environmentalists are somehow to blame for the tragic deaths from this disease. One of these papers, the "Dallas Times Herald" is due credit for its honesty in subsequently stating: 'The editorial condemning the EPA for banning DDT was based on information which later proved incorrect. We regret the error.' The facts have not, however, deterred some members of Congress from making the same baseless charge on the floor of the House of Representatives or, indeed, the Secretary of Agriculture himself from repeating the same story on several occasions. What are the facts of the matter? First, DDT had largely been abandoned for mosquito control in the U.S. before the 1972 ban on DDT because mosquitos had become DDT-resistant. Second, EPA's 1972 DDT ban specifically excluded public health uses from the ban. Indeed, EPA has in recent months given permission for such use on several occasions (for example, on rabid bats) where requested by responsible health officials. We can act rapidly in such case. Third, at least ten products are registered and available for use against adult mosquitos, particularly malathion, and a good many more are registered for use against mosquito larvae. Against adult mosquitos, malathion is the product preferred by health agencies because of its superior knockdown power. Fourth, not a single health agency in the nation has requested the use of DDT in combatting encephalitis. Those are the facts."

From left: Dave Glenz, Dr. Fred Grau, Pat Fitzsimons and Bill Rose.

Golf Course Contractors Petition for Code Change

A petition to lessen the depth of underground low voltage cables in golf course irrigation is being filed with the National Fire Protection Association by the Golf Course Builders of America.

GCBA is urging 13 other trade groups in the golf and landscape industries to join them in urging that the present 24-inch is unnecessary for open spaces such as golf courses, parks, and recreation areas. Until

(continued on next page)

First West Coast Musser Tournament

The first west coast Musser International Turfgrass Foundation Golf Tournament was played at the Illahe Hills Country Club in Salem, Oregon, October 8, under rainy skies and with a turnout of 24 golfers and near golfers. Highlite of the one day event was the appearance of Pat Fitzsimons and Dave Glenz, fresh from the professional circuit, who lent their names to the tournament as a "good cause" event.

The Musser Foundation was established in honor of the late Professor H. Burton Musser for his pioneer contributions to the turfgrass field. The Foundation was organized with the express purpose of further developing turfgrass research and education through the establishment of Fellowships at institutions of higher learning.

Dr. Fred V. Grau, Turfgrass Consultant and President of the Musser Foundation, brought greetings to the field of golfers at a noon luncheon prior to an auction for the decided advantage of having either Pat Fitzsimons or Dave Glenz on six teams for six holes per team of the 18 hole tournament.

recently, underground control wires were buried 12 inches. The wiring activates valves and starts irrigation pumps.

Nick A. Siemens of Fresno, Calif., a golf course contractor and GCBA president-elect, is directing GCBA's action to change the national electrical code requirements. He has pointed out that golf course construction costs would increase because of the tremendous irrigation footage involved in the automatic irrigation system which requires from 10 to 40 miles of wire.

In addition to higher costs, Mr. Siemens says construction and maintenance hazards would result.

Formally, GCBA will ask the National Electrical Code Committee when it meets in December, to amend Exception 3 of Section 300-5 of the National Electrical Code to add golf courses to the exception now provided for residential branch circuits of 300 volts or less.

Harry J. Lambeth, executive director of GCBA's Washington office, urges other golf associations to join the effort.

Beard Plans Expansion For Texas Turf Industry

Increasing demands by both industry and the public sector on the care and maintenance of turfgrass as well as for the development of new turfgrasses has led to an expansion of the turfgrass research program at Texas A&M University.

Heading this expansion effort is Dr. James B. Beard who has joined the staff of the Texas Agricultural Experiment Station, the state's agricultural research agency. He will give leadership to the environmental physiology, ecology and culture of turfgrasses.

"Increased leisure time, emphasis on beautification and demands for environmental protection have caused a boom in the turf industry of this state," said Dr. Jarvis E. Miller, Experiment Station director, in announcing the appointment of Beard. "The annual cost of maintaining turfgrass facilities (lawns, parks, golf courses, highway right-of-way) in Texas is estimated at $350 million.

"We must strive to develop better turf varieties and improved management practices, and this means more research involving turfgrass nutrition, shade tolerance, insect and disease resistance, and organic residue decomposition," noted Miller.

Ohio Turfgrass Show Slated for Dec. 2-4

The keynote address at the Ohio Turfgrass Conference and Show on Tuesday, December 2 will be given by Melvin J. Rebholz, Deputy Director of Resource Management in the Ohio Department of Natural Resources. Mr. Rebholz will address the Conference on the Recreational Industry in Ohio, with particular emphasis on areas relating to the turfgrass industry.

A number of outstanding programs have been planned for the Ohio Turfgrass Conference, December 2-4, at the Cincinnati Convention-Exposition Center. They include an entire session on *Poa annua* for golf course superintendents, a session on the latest from EPA and FIFRA regulations, and a personnel management session. Speakers from outside Ohio include Lee Record from the USGA Green Section, William Knoop from the Golf Course Superintendent's Association of America, Dr. Fred Ledeboer of Loft's Pedigreed Seeds, and Dr. James Watson from The Toro Company.

The equipment and product show will again prove to be the greatest available outside of a National Show. Over 50 exhibitors and 100 booth spaces have already been committed. Plan now for the Ohio Turfgrass Conference and Show. Don't miss it.

If you are involved in turfgrass management in any way, you cannot afford to miss this event. Headquarters hotel is Stouffer's Cincinnati Inn, 150 West 5th Street, Cincinnati, Ohio 45202, (513) 721-8600. Registration is $10 for OTF members and $20 for non-members. More details are available from Dr. David P. Martin, Ohio Turfgrass Foundation, 1827 Neil Ave., Columbus, Ohio 43210, (614) 422-2591.

Hawaii Turfgrass Assoc. Meets, Elects Officers

August 28th and 29th, 126 men and women gathered at the Ala Moana Hotel to exchange ideas for making Hawaii landscapes and golf courses more colorful and less expensive, during the 11th annual conference of the Hawaii Turfgrass Association.

In addition to electing a new slate of officers for the coming year, HTA members heard speeches from a variety of experts on subjects related to plant care and landscape maintenance. The convention also features six booths displaying the latest in turf grass products and irrigation equipment offered by Brewer Chemical, Occidental Chemical, Kuluwai Irrigation, Hodges Industries, the Inter-Island Equipment Company and the Thompson Products Company.

The new HTA board is: Walter Nagorski, president, Army Golf Association superintendent; Lindy Loo, vice president State Department of Accounting and General Services; Wiliam Hurter, secretary, B. Hayman Co., Inc. marketing representative; Robert Wood, treasurer, Hawaii Loa College chief maintenance engineer; Jim Barr, executive secretary, Occidental Chemical marketing representative.

Walter Nagorski, president.

Meeting Dates

Grounds Maintenance Conference, Callaway Gardens, Georgia, Nov. 18-19.

New Jersey Turfgrass Expo '75, educational conference and trade show, Sheraton Poste Inn, Cherry Hill, N.J., Dec. 1-4.

Ohio Turfgrass Conference and Show, Cincinnati Convention-Exposition Center, Cincinnati, Ohio, Dec. 2-4.

International Society of Arboriculture, New England Chapter, Sheraton-Hartford Hotel, Hartford, Conn., Dec. 3-4.

National Agricultural Aviation Association, 9th annual conference, Las Vegas Hilton and Las Vegas Convention Center, Las Vegas, Nevada, Dec. 7-11.

Illinois Turfgrass Foundation, 16th annual conference, Ramada Inn, Champaign, Ill., Dec. 10-12.

Fourth National Legislative Conference, Fairmont Hotel, New Orleans, Louisiana, Dec. 16-17.

Western Association of Nurserymen, 86th annual meeting and trade show, Plaza Inn, Kansas City, Mo., Jan. 4-6.

Tennessee Turfgrass Association, annual conference, Rodeway Inn, Nashville, Tennessee, Jan. 5-6.

Mid-Atlantic Association of Golf Course Superintendents, annual conference, Holiday Inn Belmont, Chevy Chase, Md., Jan. 5-6.

Indiana Chapter, International Society of Arboriculture, Stauffer's Indianapolis Inn, Indianapolis, Ind., Jan. 6-8.

Pennsylvania-Delaware Chapter, International Society of Arboriculture, Marriott Hotel, Philadelphia, Pa., Jan. 7-9

Kentucky Chapter, International Society of Arboriculture, Stauffer's Inn, Louisville, Ky., Jan. 20.

Michigan State University Turfgrass Conference, Kellogg Center, East Lansing, Michigan, Jan. 21-22.

Ohio Chapter, International Society of Arboriculture, Sheraton Columbus Hotel, Columbus, Ohio, Jan. 25-29.

Virginia Turfgrass Conference, Sheraton Motor Inn, Fredericksburg, Virginia, Jan. 28-29.

Southern Weed Science Society, 29th annual meeting, Statler Hilton, Dallas, Texas, Jan. 26-29.

One Week Winter Short Course, Turfgrass Management, West Tennessee Experiment Station, Jackson, Tenn., Jan. 26-30.

Turf and Landscape Conference, annual meeting, Tappan Zee Inn, Nyack, N.Y., Feb. 4.

American Sod Producers Association, mid-winter conference, Sheraton Sand Key, Clearwater, Fla., Feb. 5-6.

Golf Course Superintendent's Association of America, 47th international conference and show, Auditorium and Convention Hall, Minneapolis, Minn., Feb 8-13.

Midwestern Chapter, International Society of Arboriculture, Sheraton-O'Hare Motor Hotel, Rosemont-Chicago, Ill., Feb. 10-12.

Canada Chapter, International Society of Arboriculture, Chateau Frontenac Hotel, Quebec City, Quebec, Feb. 12-14.

Wisconsin Arborist Association, annual convention, Midway Motor Lodge, LaCrosse, Wisconsin, Feb. 18-19.

Southern Chapter, International Society of Arboriculture, Myrtle Beach Hilton, Myrtle Beach, S. Carolina, Feb. 22-25.

Shade Tree Short Course, 19th annual, Scheman Continuing Education Center, Iowa State University, Ames, Iowa, Feb. 25-27.

Western Society of Weed Science, annual meeting, Sheraton-Portland Hotel, Portland, Oregon, Mar. 16-18.

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Top 100 Products Award Goes to Dow's N-Serve

N-Serve nitrogen stabilizer has been selected among the 100 most significant new technical products of the year in the annual "I-R 100" competition sponsored by "Industrial Research" magazine.

An award was presented to Dow Chemical U.S.A. at a formal awards banquet at the Museum of Science and Industry in Chicago, September 18, as the event launched a month-long exhibit of "I-R 100" award winners to the public.

N-Serve nitrogen stabilizer provides a new concept in fertilizer management and conservation.

Faced with fuel and fertilizer shortages, everyone is concerned about saving trips over the grounds and making certain that every pound of fertilizer placed in the ground is fully utilized.

The recovery of fertilizer nitrogen by plants in the year of applicaion amounts to about 50 percent. Biological transformations, losses by leaching and losses as nitrogen gas to the atmosphere are primary causes of this low rate of utilization.

N-Serve inhibits the action of the soil bacteria that rapidly converts ammonium nitrogen to nitrate ions preventing leaching from the soil and loss to the atmosphere.

Ohio Turfgrass Field Day Features Research Data

Ohio State University's 1975 Turfgrass Field Day offered a refreshing approach to the typical classroom-tye turfgrass sessions.

On Wednesday, October 1, an estimated 100 turfgrass growers, managers, and golf course superintendents got a first hand look at work conducted by Ohio's top turfgrass researchers. The program was hosted by Ohio State's Department of Agronomy and Cooperative Extension Service, Ohio Agriculture Research and Development Center and the Ohio Turfgrass Foundation.

The field day consisted of a ten-stop program. Each stop highlighted current research in the areas of turf disease, thatch, localized dry spots on sand greens, turfgrass cultivar evaluations, insect control, glyphosate and bluegrass cultivars under low fertility.

Dr. Dave Martin recommended, from his research data, a variety of cultivation practices for the control and elimination of thatch problems. His tests also involved several organic materials currently on the market for the control of thatch.

Most superintendents agree that Phythium blight was their largest turf disease problem this year. And doctorate research by J. L. Saladini indicated that Phythium may be more of an unknown problem than superintendents realize. He stated that the fungus may be active in the turf root zone long before any typical symptoms are present. "Preliminary activity by this fungual disease causes considerable root loss thereby reducing the recuperative potential of the surviving turfgrass," Saladini said.

How to Make $900 Profit*... And Get the Jump on Iron Chlorosis, too!

Here's a "triple-play" you can't refuse. Buy our Combination Bulk-Pak before Dec. 15 and we will give you 50 Mini-Caps absolutely free. THAT'S $47.50 WORTH OF FREE MINI-CAPS. Total retail value of this special offer is $183.40. If you are a commercial applicator you can realize more than $900 in profit from the trees you can treat (see chart at right). No matter how you look at it you can't lose with this deal.

***If You're an Applicator Here's an Idea of What You can do with this Offer!**

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25	3" DBH trees @ $17.50 ea.	$437.50
16	7" DBH trees @ $23.00 ea.	368.00
7	14" DBH trees @ $34.00 ea.	238.00
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	Cost of Goods (at retail)	135.90
	Profit	$ 907.60

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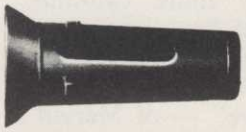

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Huber Ranch Sod Nursery

"Instant Lawns for Home and Industry"

By TOM STUNDZA, "The Post-Tribune," Gary, Indiana

A FOG BANK has rolled off the nearby Kankakee River so the gray dawn reveals a heavy, wet cloud hovering atop the flat, green acreage of the Huber Ranch. Yet, at 6 a.m., men and machines already are well into the harvesting of the ranch's only crop — sod.

"The timing of the harvesting is important," explains Bill Huber, the owner. "We start harvesting the sod at 3 a.m. so that, in the coolness of the morning, we can insure freshness in our rolled product."

Under fertilization, irrigation, rolling and constant mowing to a uniform height, the sod is harvested in strips — 18 inches wide by six feet long.

At the Huber Ranch Sod Nursery, Inc., one of the largest in Indiana, 1.5-to-2.5 acres of what Huber calls "instant lawns for home and industry" are harvested every day in a season that runs from March 1 to Dec. 1.

Five hundred and thirty-five of the ranch's 820 acres are set aside for sod production. Half the sod acreage is harvested every year, while the other half is allowed to grow wild for gathering the succeeding season.

Located along U.S. 41, about a dozen miles southwest of Crown Point, the Huber Ranch has been used for sod production since 1967. Annual sales now approach $1 million.

"The land has a lot going for it that makes it ideal for sod," says Huber. "First, the soil is an organic, black, mineral soil with a high water table. Second, the ranch, itself, is perfectly flat; there's only a six-inch slope across the entire two-mile width of the ranch."

The sod grown at the Huber Ranch is a special blend — called an "executive mixture" — of Merion, Delta, Fylking and Sodco seeds, developed by Huber and consultants at Purdue University.

"The big difference between our sod and that of our largest competitor (Shamrock Turf Nurseries, Inc., a 721-acre sod farm in LaPorte County) is that our sod is grown in fertile river bottom while their's is grown in peat," explains Huber.

He contends that his product — due to the soil, seed blend, and fertilization-irrigation processes used at Huber Ranch — "will give the busy executive or anybody else an almost carefree, yet luxurious, lawn." He adds that, as the sod industry is a relatively new professional farming industry, "it is an extremely competitive business" so consumer costs are kept low "to foster growth within the industry."

"What we are selling is the green of our fields," Huber says. "And, personally, I want to become well known in the sod business for doing just that — selling the green of our sod all over the Midwest."

Huber Ranch now has 15 dealers in Indiana and Illinois selling its product and 18 employees involved in the cultivation, harvesting, and semi-trailer delivery of the sod.

The ranch also is branching into the wholesaling of allied nursery products — seeds and fertilizers, specifically. And, for the past five years, has had a large "hog finishing" operation.

Huber sells 3,000 hogs a year he has bought at two months, weighing 40 pounds, and "feeds them out" to market weight, 225 pounds, at six months of age.

Huber also harvests the three-foot-high wild grass from sod acreage to be harvested the next year, and sells the hay to cattle farmers and contractors who use hay in the winter to "cure" concrete.

"But, it is the sod where we spend most of our time and money," says Huber. "We really try to 'sell' the public because high volume of sales cuts down the per unit overhead. Yet, it really is a good deal for the public because sod provides a thick, guaranteed lawn with almost 18 months worth of fertilizer, top soil and growing grass."

Huber, a graduate of Notre Dame University with a bachelor's in business administration, is using his sod operation to once again make Huber Farms of Schneider a well-known operation.

The ranch was founded in 1947 by his father, the late William C. Huber, then owner of the nationwide Huber & Huber Motor Express Co. of Louisville, Ky.

In the 1950s and 1960s, under the elder Huber and his son, Harold L., the Huber Ranch gained recognition for its vast herds of prize-winning Polled Hereford beef cattle.

In the middle-1960s, the Huber family sold its 2,000-truck, 5,000-employee transport company to Smith Truck Lines of Staunton, Va., and sold the cattle. Harold moved to Shelbyville, Ky., where he went into the farm implement business.

"So, there I was in 1967, with 820 acres and the knowledge that I didn't want to sell the property and I didn't want to become a corn farmer," says Bill Huber.

"The people at Purdue suggested sod and we've done real well, and are going to do better, in that area," he adds.

Besides the content of the soil, the Huber Ranch's location makes it easily accessible for truck and rail transport. Split by "new" U.S. 41, the ranch's eastern border is "old" U.S. 41. And, Penn Central railroad tracks — both east-west and north-south — converge at the northeast corner of the Huber property.

In fact, the Industrial Development Department of the Penn Central Transportation Co. has suggested the use of some of the Huber Ranch's property as a 250-acre industrial park. □

Builders Champ

Golf Course Builder John C. Floyd Jr., of Nashville, (right) receives the 1975 Moore Golf trophy from David Canavan, president of Moore Golf, Culpeper, Va., for his victory on the Grand Hotel's course at Point Clear, Ala., during the summer meeting of the Golf Course Builders of America. Floyd, who directs golf construction for Site Preparation Inc., defeated other contractor golfers and will hold the trophy until the 1976 GCBA tournament in Monterey, Calif. Canavan was the president of the Golf Course Builders of America.

Toro's Windom Employees Ratify 3-Year Contract

The Toro Company today announced that agreement has been reached with the employees of its manufacturing plant at Windom, Minn., on a new three-year labor contract extending through Sept. 30, 1978.

A Toro spokesman said that "a large majority" of the 475 employees concerned ratified the terms of the new contract yesterday before the expiration of the previous agreement. They are members of Local 1956 of the International Association of Machinists and Aerospace Workers. Local president, Emil Horkey, headed the union negotiating team.

In addition to a wage increase, the new agreement provides for improvements in holiday and vacation schedules and in insurance protection.

USDA Plant Permit Office Relocated to Hyattsville

Travelers or importers wishing to bring foreign plants, soil, or plant products (fruit or vegetables) into the United States now must send their applications for federal permits to a new address.

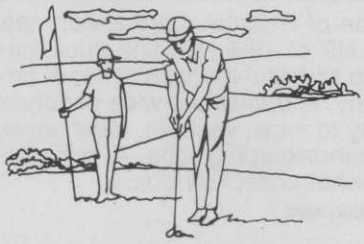
After 30 years in Hoboken, N.J., the five-person permit-issuing office of the U.S. Department of Agriculture (USDA) has moved to Hyattsville, Md. The move consolidates manpower and record-keeping at Hyattsville.

James O. Lee, deputy administrator of USDA's Animal and Plant Health Inspection Service, explained that permits are required under federal regulations designed to protect America's plant life from destructive foreign plant insects and diseases.

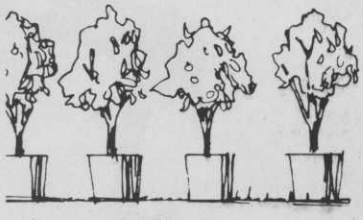
Horticultural Perlite...

The multi-purpose soil conditioner for turf, containers and propagation.

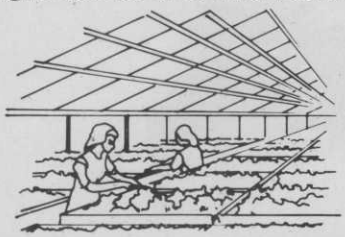
Professional landscapers and grounds maintenance men have long made Horticultural Perlite one of their main 'tricks of the trade'. It's an ideal soil conditioner that helps promote "a sea of green velvet". You see, by preventing compaction, it keeps the soil loose enabling more oxygen to reach and help nourish the root system. And because Horticultural Perlite also retains three to four times its weight in moisture, it keeps the root network moist long after watering. The result is a beautiful blanket of green growing on a thick healthy, robust root-system that not only keeps grass beautiful, but prevents **golf courses, institutional and campus lawns and residential lawns** from getting soggy, mushy or soft underfoot.



Nurserymen find Horticultural Perlite practically indispensible for **container grown plants and shrubs** because of its ability to retain moisture, and to keep the mixture around the root environment loose. It is also a great "starting mixture" for transplanted stock as it helps reduce the incidences of transplant shock. And because Horticultural Perlite is sterile and non-toxic, it won't rot, decompose, disintegrate or break down. Nor will it help promote insect life. Being light in weight, Horticultural Perlite makes container moving light work and shipping costs a lighter expense. It's not only ideal for your plants — Horticultural Perlite is ideal for your business.



For **plant propagation**, Horticultural Perlite soil mix is almost as important as sunlight. Because of its water-retention characteristics, this mixture maintains an even distribution of moisture to stimulate fast root development in cuttings and to speed seed germination. Most important, by keeping the starting mixture loose, Horticultural Perlite permits a freer flow of oxygen to help nurture the new growth. This also makes transplanting easy; without root damage; and without undo shock. Horticultural Perlite is inert matter that can last indefinitely in your seed beds. It is sterile, odor-free and can't promote insects or bugs. It is a great asset for the new beginnings of plant life.



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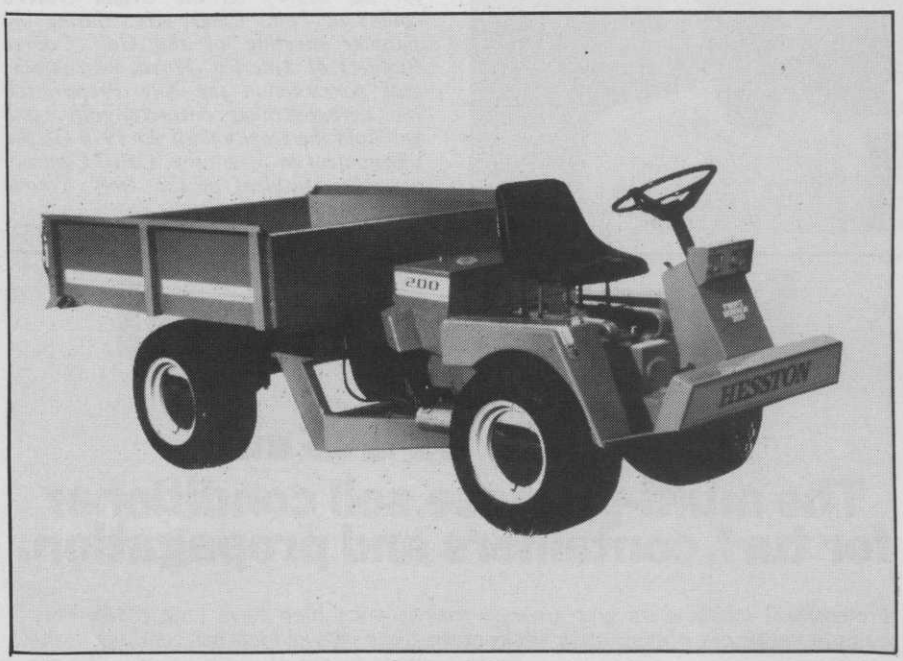
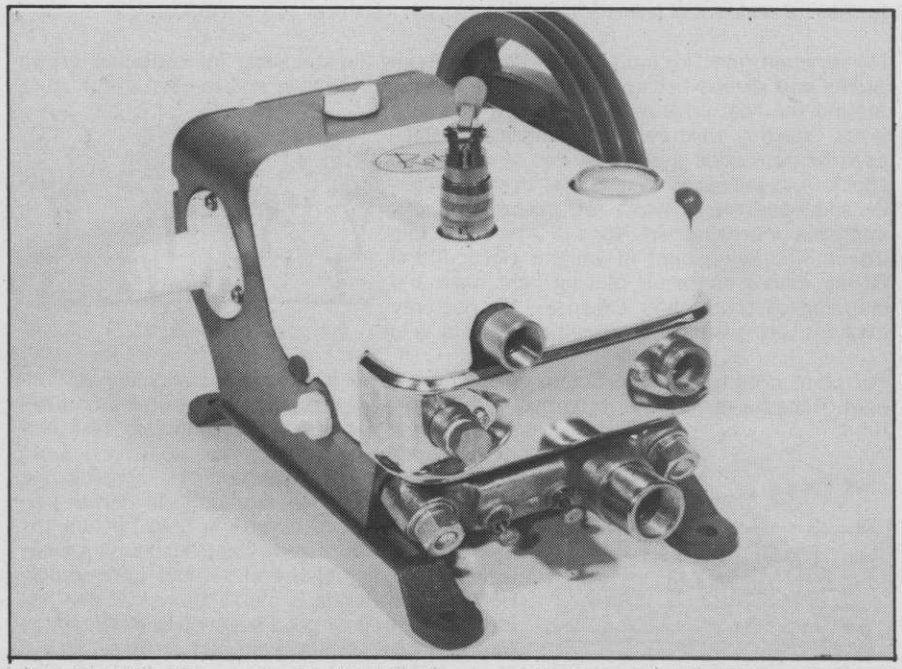
New Products



TURF TRUCK: The Lawn Equipment Division of Hesston Corporation new Front Runner Truck is available in either 16 HP or 19.8 HP. The truck features a ¾ cubic-yard bed for hauling loads up to 1,000 lbs. of dirt, sand, fertilizer, or equipment, according to the company. In addition, a wide variety of attachments give the unit all-season versatility to mow, vacuum, clear snow, move dirt and handle a variety of other groundskeeping jobs. A self-contained vacuum attachment features a 50-bushel collection box.

Circle 701 on free information card.

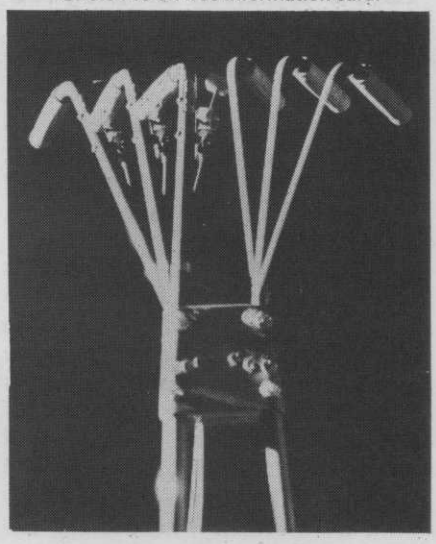


PCO PUMP: This unit is available in five models from 2 to 30 GPM at 500 psi. Robco, Inc., says this unit's big feature is its long life with minimum maintenance. The manufacturer says by removing four bolts, slipping out and replacing the packing, the unit has been serviced.

Circle 702 on free information card.

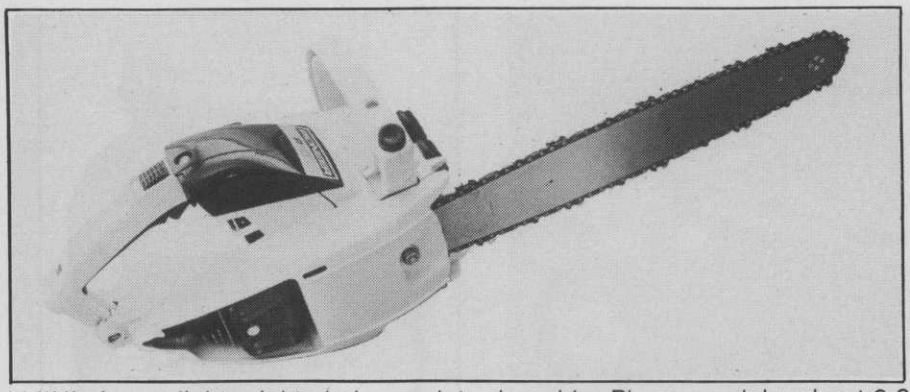
ADJUSTABLE: Goodall's edger-trimmers are equipped with handles which will adjust to nine different positions to protect hands and knuckles and provide easier maneuvering when trimming against walls, fences, etc., according to the manufacturer. Adjustable handles are available on 8, 10, 12, and 18 in. edger-trimmers.

Circle 703 on free information card.



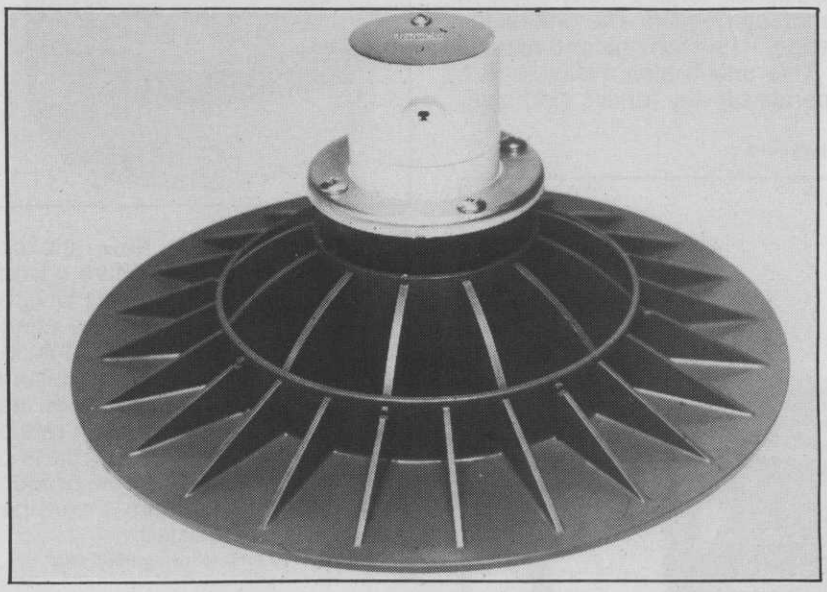
VISES: Four styles of vises in a variety of models and sizes for almost any workshop application are now available from Allis-Chalmers Corp. The vises include a utility clamp vise, bar vises, channel vises and a special heavy duty vise for machinists. High tensile grey cast iron provides needed strength. while the bar, channel and machinists vises have replaceable cold rolled steel jaws for added life.

Circle 704 on free information card.



MINI: A new lightweight chain saw introduced by Pioneer weighs about 6.6 lbs. without attachments and has a 2.2-cubic-inch engine. The manufacturer says other features include die-cast magnesium construction, a self-cleaning automatic oiler with manual override, a Tillotson carburetor, and a standard 12-in. sprocket nose bar.

Circle 705 on free information card.

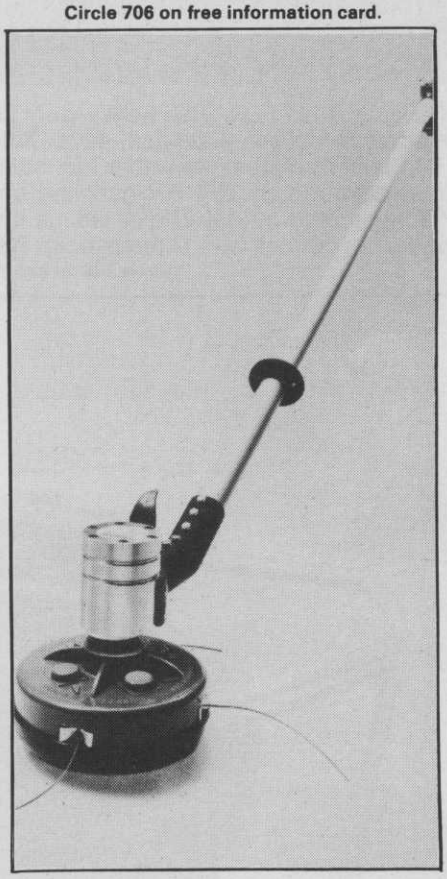


SUPPORT: A stabilizing support flange for irrigation sprinkler heads, is engineered and designed to be completely under the turf surface, says Sage-T-Lawn, Inc. The flanges protect heads from tilting or being pushed into the ground by heavy maintenance equipment. Drain holes in flanges prevent puddling around sprinkler heads.

Circle 707 on free information card.

HYDRAULIC: A new grounds maintenance tool, called a Weed Eater, uses a special head that spins four heavy duty strands of monofilament line at more than 4,000 rpms, says Stanley Hydraulic Tools. The manufacturer claims that the tool is especially useful in leveling vegetation around trees, fences, guard rails, highway signs, etc. The unit can cut over glass bottles, tin cans, rocks, electrical cable and other unseen obstacles without the dangerous flying debris caused by solid cutting blades.

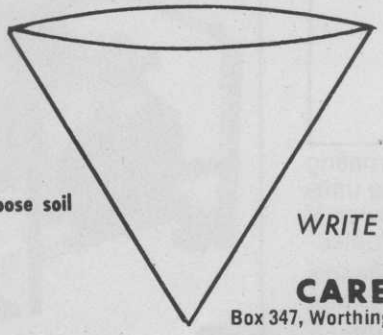
Circle 706 on free information card.



CARETREE TRANSPLANTERS ON *YOUR* tractor — LOADER — CRAWLER

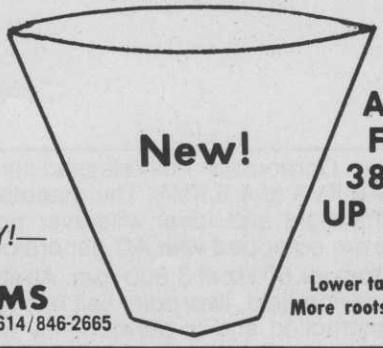
Two spade designs, interchangeable - to meet your requirements and soil conditions

TIGHT CONE



30 Inches Dia.

TRUNCATED



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Lower tapered Pot-shaped ball
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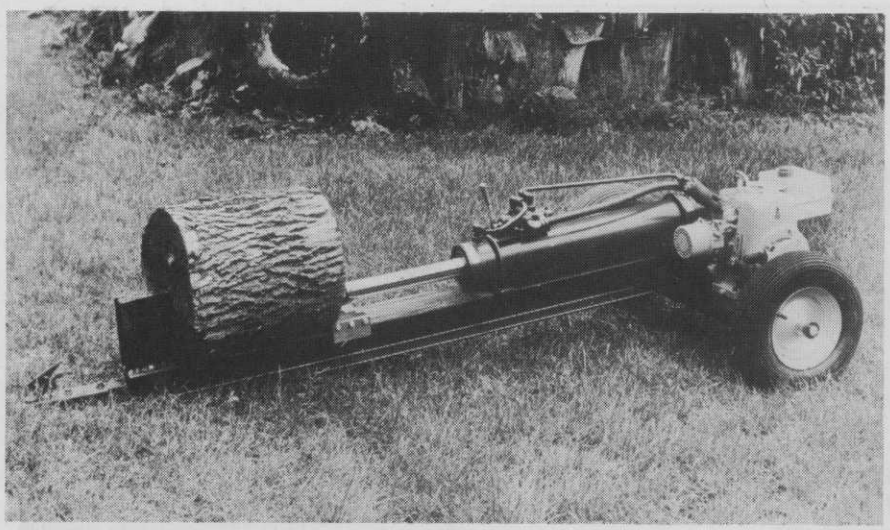
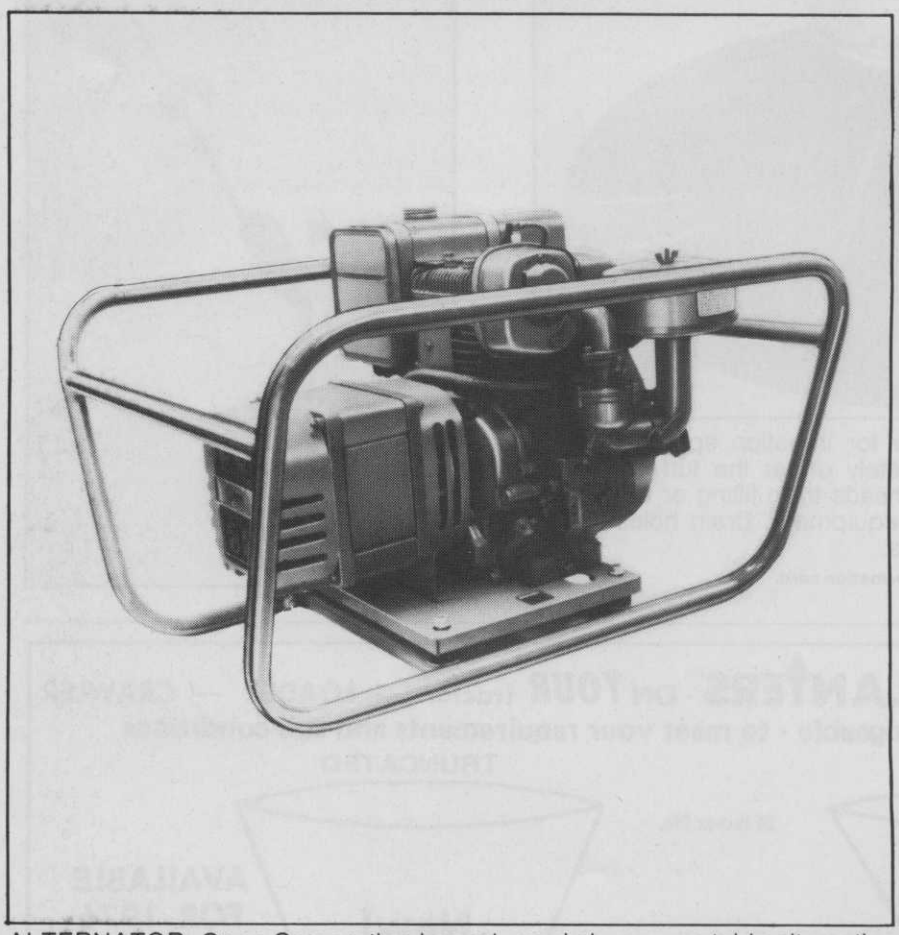


HYDRA-SPLITTER: This heavy-duty unit is designed to give many years of reliable, trouble-free service, says Didier Manufacturing Co. The unit exerts 10 tons of ram pressure with a 7 in. cutting wedge. It has a 20 second recycle time, powered by a 4 HP gasoline engine. This unit is also available in a PTO-operated model. Didier claims it will operate off any forklift, skid steer loader, or tractor with a three-point hitch.

Circle 708 on free information card.

SPRAY STICK: A new sticker-extender spray additive, from Nursery Specialty Products Div., of J. A. Hartman, prolongs the effective life of pesticides, fungicides, insecticides and other horticultural and agricultural sprays, claims the manufacturer. With a dilution rate of one part spray-stick to 800 parts of the primary spray, the new product actually costs less than ½ cent per gallon of spray treated.

Circle 710 on free information card.

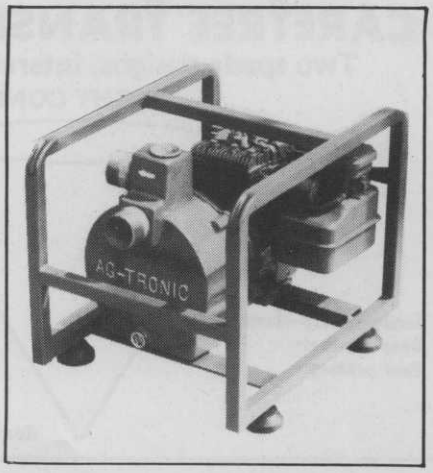


ALTERNATOR: Onan Corporation has released six new portable alternating sets ranging from 1.0 KVA to 4.5 KVA. The manufacturer claims these units are rugged yet lightweight and ideal wherever portable electric power is needed. All models are equipped with AC generators to provide 50 Hz electric power at 3,000 rpm, or 60 Hz at 3,600 rpm. All six models employ Onan's AC generator of revolving field, two-pole, self excited design. The generator is of drip-proof construction and is permanently aligned to the engine.

Circle 709 on free information card.

PUMP: The Kearney Division of Ag-Tronic, Inc., is now manufacturing a line of utility pumps available in 3 HP and 5 HP models. The units feature capacities of 150 and 200 PGM, powered by a Briggs and Stratton engine.

Circle 711 on free information card.



People on the Move

Paul Hamann, promoted to branch manager of the Indianapolis, Indiana distribution center of Thompson-Hayward Chemical Company. Hamann will be responsible for the administration and sales of the company's complete line of industrial and agricultural chemicals, feed additives, and textile maintenance supplies.

* * *

Frank P. Popoff, named general manager of the Ag-Organics Department of Dow Chemical U.S.A. Popoff, the director of marketing for Ag-Organics since 1971, succeeds Robert E. Naegele, recently named president of Dow Chemical of Canada, Limited.

* * *

Thomas H. Wyman, president and chief executive officer of Green Giant Company, of Chaska, Minn., has been elected to the board of directors of The Toro Company. Wyman's appointment to the Toro 10-man board was effective October 1.

* * *

Frank J. McDonald, named Cushman-Ryan national sales manager under a restructuring of the OMC-Lincoln marketing group (division of Outboard Marine Corporation). The restructuring involves 11 positions and completes consolidation of Outboard Marine Corporation's non-marine product lines under one marketing umbrella. Other employees assuming new duties: **Edward J. Molaskey,** Cushman-Ryan field sales manager; **Vernon J. Worrel,** manager-engineering planning; **John Schubert,** director of customer relations; **Charles W. Beam,** manager-marketing planning; **Daniel L. Hedglin,** service manager. **Ed Large,** manager-marketing communications; **Lee Heckman,** sales administration manager; Tom J. Reynolds, Pioneer national sales manager; **Robert W. Reid,** Lawn-Boy national sales manager and **Vaughn E. Border,** who will direct OMC-Lincoln distributor operations.

* * *

Sandra Hochhausen, appointed to the sales force of Grass Growers, Inc., of Plainfield, N.J., as a promotional/sales representative. Hochhausen will travel extensively throughout the U.S. promoting the exclusive line of Terra Tack, erosion control binder for straw, hay and wood fiber mulch.

* * *

Kenneth Bradfield, appointed marketing manager of the new TURF/AG Division of Hahn, Inc.

* * *

George O. Voss, appointed area sales manager covering the Northeast, North Central and Southeast regions for Stauffer Chemical Company's Agricultural Chemical Division. In other company moves: **John B. Juvenal,** moves to regional sales manager covering the Southeast region. **Clay M. Blakemore,** heads district sales region covering the Delta District. **Roy Rau,** appointed area sales manager covering the Midwest, Southwest, Western and Pacific Northwest regions. **Gale Harold** appointed regional sales manager covering the Midwest region. **Jerry Lacey** district sales manager of the Colorado district. **Harold L. Straube,** became chairman of the board of the National Agricultural Chemicals Association for 1976 at the recent annual meeting of the association. He is vice president and general manager of the Agricultural Chemical Division and also a director and member of the executive committee of the NACA.

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Operator Controls and Comfort were priorities when we designed the Grasshopper. We placed the operator in a comfortable position with controls at his fingertips . . . then we attached a lot of performance to those controls. Handling is the key to the Grasshopper's ability to cut along-side of, if not around, larger mowing equipment.

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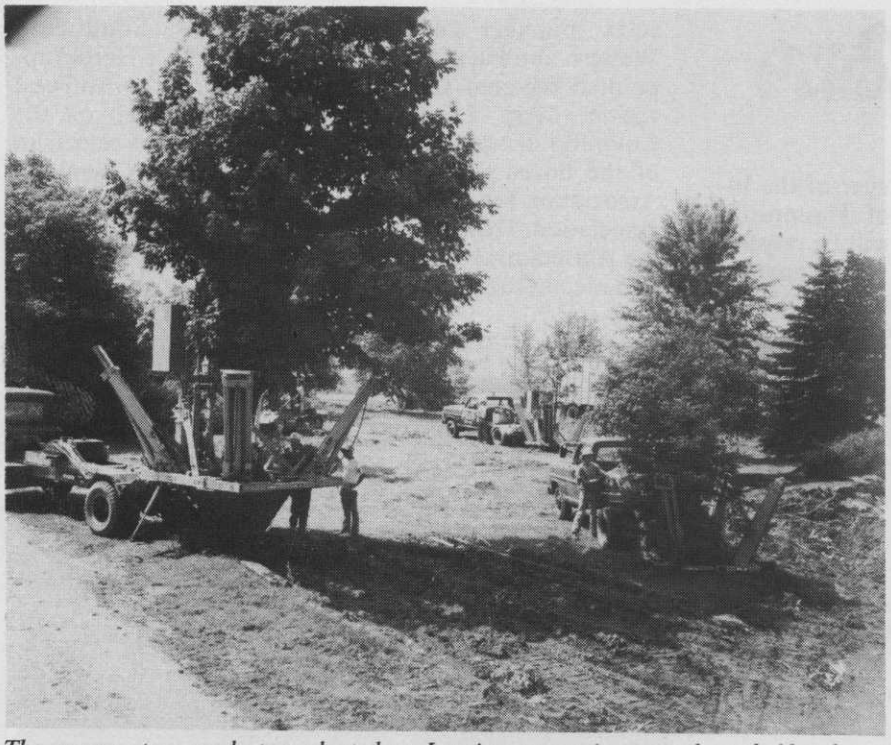

The average tree spade tree planted on Lansing streets is two-and one-half inches in diameter. Many of the trees come from the city nurseries, from row purchases at wholesale nurseries, and from discounted overgrown stock.

Choose the proven winterizer.

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Your most effective winter kill protection is WILT PRUF NCF*. Prevent excess water loss caused by drying winter winds. For pennies a plant, save many dollars in losses of shrubs, trees and roses. Eliminate burlap windscreens. For over 20 years, top nurseries in every state have successfully used WILT PRUF against excess water loss in all seasons. Approved for use on all growing edible products.

**NCF—Non-Clog, not damaged by freezing.*

Available in 12 oz. aerosol, 1 qt., 1 gal., 5 gal., 30 gal. and 50 gal. (U.S.) sizes.

Write for technical information.

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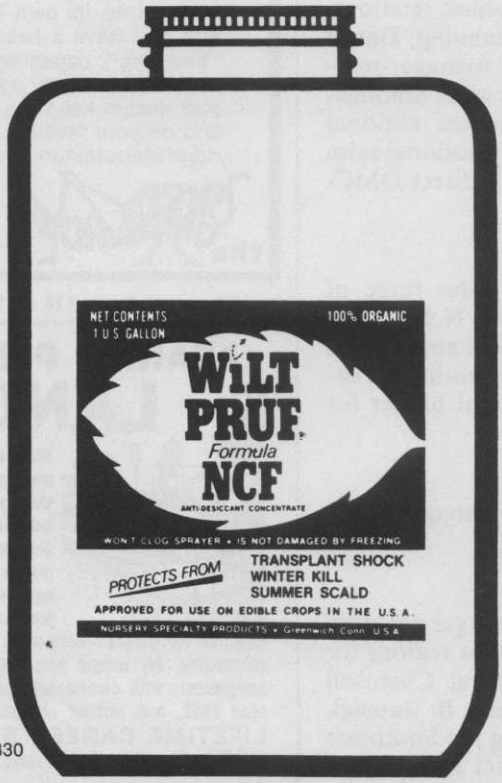

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TREE SPADE *(from page 16)*

rected to $17.68). Remaining costs for supplies, equipment and labor for watering and other miscellaneous items add $18.05 to the bare root cost and $6.82 to the tree spade cost. This gives a total cost for a surviving bare root tree of $72.21 and a surviving tree spade tree of $53.79. The 1973 projection of 2.5 surviving tree spade trees planted for each bare root surviving tree was substantiated only in principle. A corrected ratio is approximately 1.5 tree spade to 1 bare root tree. It is felt that this ratio will level out at approximately 2 to 1 for a normal year.

The last two years produced a number of factors which caused a loss of efficiency for the tree spade method. An early snowfall in November caused the addition of a tractor-loader to the tree spade operation which was used to remove snow from the planting sites and the nursery. This allowed the trees to be dug and planted at the proper depth. Muddy conditions for abnormally long periods in the nursery decreased production and increased towing charges. The total down time for bad weather came to 16% in 1973-1974 and 23% in 1974-1975. The tree spade truck (not the TS44T) broke down numerous times causing 26% lost time in 1973-1974 and 22% in 1974-1975. The 1973 projection was for 6 trees planted per work day. The 1973-1974 actual figures averaged 5.5 trees planted per work day and in 1974-1975 the average was 5.0 trees planted per work day. The tree spade operated approximately 50% of the total work days for both years.

A total of 689 tree spade trees were planted in 1973-1974 and 794 were planted in 1974-1975 in spite of the abnormal weather conditions and lengthy truck repair time. This quantity was in part due to the use of the tree spade in conjunction with wire baskets for balling trees where the haul distance was not economical. A number of trees were also planted with the use of "tree cans", a method using metal cans to transport tree spade dug trees. In both cases the total cost per tree planted goes up but a larger number of trees can be successfully planted in a short time.

The disadvantages of planting by the tree spade method can be summarized into four items:

1. abnormal weather (too wet, too much snow and too hot)

2. unplantable sites (utility conflicts and narrow parkways)
3. unavailable trees within an economical haul distance; and
4. lack of an equipment operator

It is the opinion of the Lansing Forestry Division that the advantages far outweigh the disadvantages for tree spade planting. Surviving tree spade trees are cheaper than bare root trees through greater survival, less special care and much less loss due to vandalism. The operation can take place twelve months of the year with one full time tree spade operator. This makes the activity routine and creates much less interruption of other work activities such as occurs when setting up for a bare root planting season.

Perhaps the biggest advantage is the ability to plant up to a four inch diameter tree. The City of Lansing normally plants one and one-half to two inch diameter bare root stock and suffers much higher mortality whenever a tree over two inches is accidently planted bare root in the heavy clay soils. The average tree spade tree planted during the last two years is two and one-half inches diameter with many coming from the city nurseries, from row purchases at wholesale nurseries, and from discounted overgrown stock. The gratitude of a property owner having a larger tree planted in front of his reisdence is overwhelming. The goal of the City of Lansing is to operate the tree spade primarily out of its own nurseries with three inch diameter stock being put on the streets. The operation of a city tree nursery is seen as the most economical method of procuring trees. The basic requirements include good available land within an economical haul distance of the center of the city (five miles for Lansing), a species mix to fill requirements, a maintenance program of band herbiciding tree rows and mowing the sod centers, and a tree spacing of paired rows with individual tree spade access to one side of each tree. An alternate procurement method to consider would be contract growing by a local private nurseryman.

One last advantage of having a tree spade is the capability to perform special planting jobs quickly and cheaply, whether it be for an instant mini-park or transplanting a donated specimen tree rose to a bicentennial rose bed. □

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APPLICATION *(from page 21)*

cations with 2,4,5-T and adhere to the restrictions of the USDA and VDA, EPA, and OSHA as to application near ditch banks, lakes and streams and close to buildings.

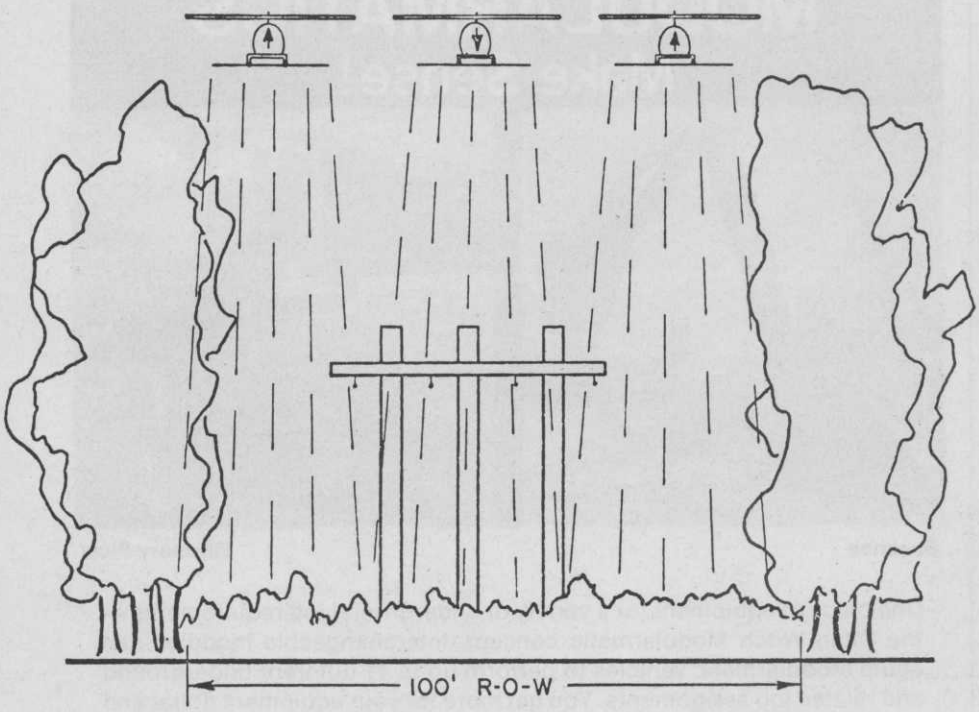
Because of the need for good public relations and the fact that the foliage of brush turns brown after spray treatment, it is advisable that no brush **over four feet in height** should be treated with foliage spray. The preferred treatment of brush and shrubbery growth over **four feet should be cut first,** then given basal spray control, thus avoiding unsightly brown foliage and public criticisms.

Calibration of Aerial Sprayers

Calibration of helicopter sprayers — Actual output per acre of aerial spray rigs is of utmost importance as with any method of pesticide application. The delivery at ground level of a predetermined amount of liquid per acre is not easy to accomplish, especially in uneven terrain where utility lines are at various heights from the ground.

Each type of aerial spraying equipment performs differently and the pilot should be thoroughly checked out with each type as he would be with different types of aircraft. For instance the width

(continued on page 36)



This is a typical profile of a cross country line 44 KV or higher.

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International Harvester Continues Merging Efforts

Pay Line Division of International Harvester has entered Phase II of its program to merge all divisional marketing efforts into one integral organization with consolidation of construction and industrial equipment sales forces.

The consolidation, to be implement between now and the start of the 1976 fiscal year on November 1, completes the merger which was begun last year, explained J. L. Adams, Division marketing vice president.

"At that time we combined all the marketing departments, except sales," he said. "We did this deliberately because we did not want to disrupt the on-going relationship between our sales people and the distributor organization during the merger and centralization at Schaumburg of all other marketing functions.

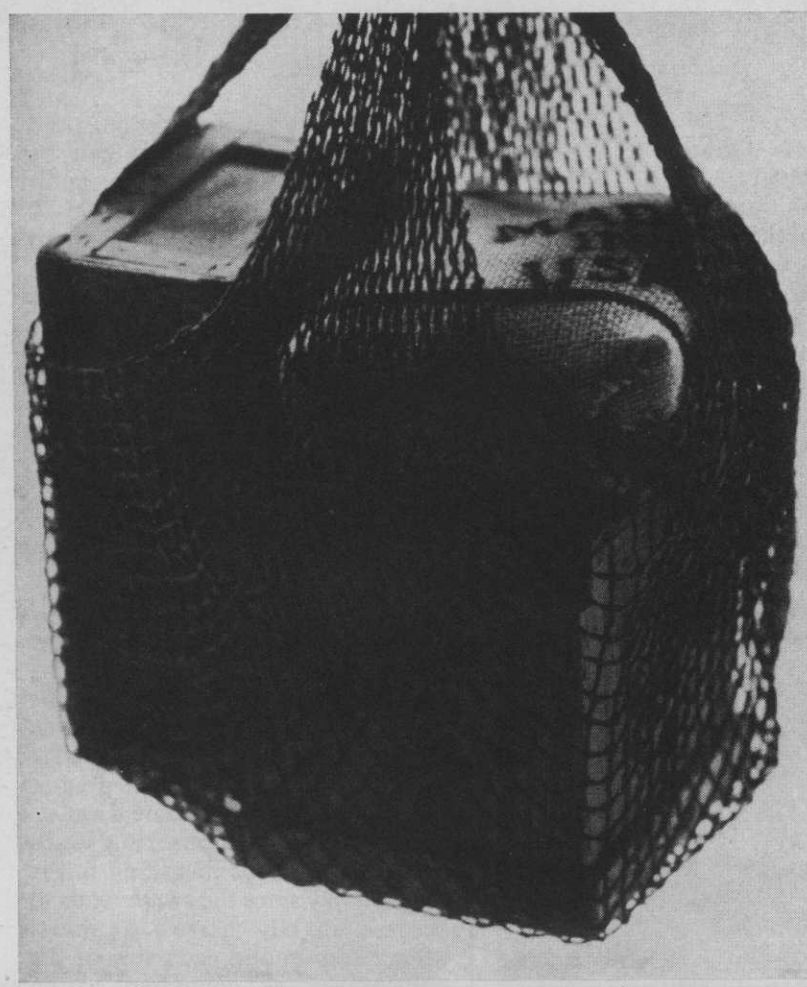
"We were cognizant of the fact that this step — Phase II — would have to be taken as soon as we, and our distributors, were ready to assimilate it. That time is now."

Under Phase II the country has been divided into eight regions, with a Pay Line sales force in each responsible for the sale of the entire line of International industrial and construction equipment.

"We will have a mutuality of territory with no duplication of efforts for both product support and sales," Adams said. "The boundaries of the new sales territories are almost identical to those of our Product Support regions and this will result in allaround better sales and service for our distributors and their customers."

Under the new concept J. P. (Jim) Brady, former Industrial Equipment sales manager, and T. C. (Tom) McGonigle, former Construction Equipment sales manager, become managers of equipment sales for the entire line. Brady and his organization will be responsible for the northern tier of states and McGonigle and his group will cover the southern and far western states.

K. R. (Ken Foster, formerly manager, General Product Sales, becomes assistant to the vice president, marketing.



How to sell more at home. Export.

Expanding production to meet new markets abroad, creates new jobs and profits here. That extra buying power—multiplied by many firms doing the same thing—can really boost the economy. Improve your selling climate at home. Expanding your volume can also help reduce unit costs. So you can be more competitive and sell still more, both here and abroad. No wonder exports of manufactured goods, already worth $95 billion a year are growing at a faster pace than domestic sales. And note that 3 out of 5 exporting companies have less than 100 employees. For more information write: Rogers C. B. Morton, Secretary of Commerce, U.S. Department of Commerce, BIC 3B, Washington, D.C. 20230.

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APPLICATION *(from page 34)*

covered by the Microfoil boom will be approximately double the length of the boom at 50' height using .028" orifices whereas the 060 boom will cover a width approximately double its length at a height of 125'. As with calibrating other types of spray equipment the following are of importance:

1. **Air speed**
2. **Pressure**
3. **Swath width**
4. **Volume**

In addition for aircraft calibration the height from the ground is very important since the effective swath is largely governed by this factor. Charts are provided for proper speeds and height to cover given heights in aircraft manuals and by the spray equipment manufacturer.

In actual calibration the pilot should first be sure that the air speed indicator is correct. This can be checked by flying over an automobile at low speeds (15-20-25-30 mph etc.). Since aircraft air speed indicators are not very accurate on the low end of the speed range. Once the aircraft speed is known the volume of spray delivered per minute should be determined in actual flight.

With a 50' swath, 1 mi = 6 acres and 100' = 12 acres (approx.)

If 10 gal./acre is desired it would be necessary to deliver 10 gal/min at 60 mph, using a 26' boom at 50' height with the Microfoil boom. If the height must be increased and the swath width increases then the aircraft must be slowed down or the pressure increased in order to apply the correct amount of spray. Raising the pressure is not advocated since this will often produce fine droplets that drift easily. In checking swath width it should be measured in the right-of-way since the swath tends to become slightly narrow in areas where trees bound each side of the right-of-way as compared to an open area.

Other factors that influence the application rate are "crabbing" or flying slightly sideways to compensate for air movement will narrow the swath width and cause "streaking" in wide rights-of-way. In general a pilot learns many of the fine points of spraying with experience and cannot become proficient until he has mastered the many different situations involved in aerial spraying.

Spraying with a helicopter is not only useful in controlling weeds and brush underneath the conductors but side trimming of adjacent trees is also accomplished in the same operation. This greatly reduces future trimming costs and aids in preventing electrical outages during wind and ice storms. In spraying operations one pass is generally made to a given area regardless of the equipment being used on the helicopter. Better results can usually be obtained by flying in both directions, especially with the Microfoil boom, but this increases costs per acre. With equipment that deliver higher gallonage with larger droplets such as the Spray Disk as the 060 one pass is sufficient. □

Applying engineering designs which "Sound Conditioned"* our industrial scrap reduction machinery, Mitts & Merrill can modify our brush chippers for low noise levels. At the same time, those engineering features which have made Mitts & Merrill the leader for years have been retained.

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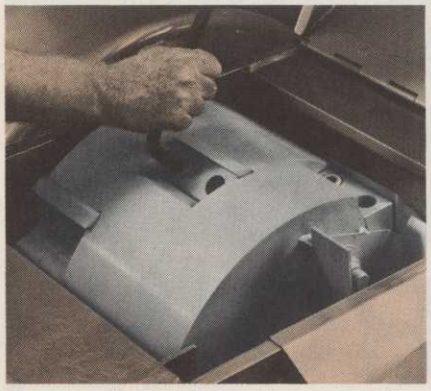
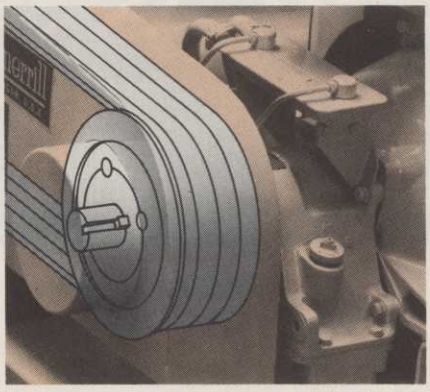


Staggered knife pattern, for years a Mitts & Merrill feature, has always resulted in a lower noise level. First, by segmenting the noise source. Second, through smoother cutting action. Third, by producing smaller chips.



Optional torque converters and the heaviest steel cylinder — even without an external flywheel — combine to give positive cutting action under the most rugged conditions. Isolates the engine from shock. Minimizes maintenance.

Plus • **Positive safety-lock pin** for greater operator safety • **Swing-away, folding feed chute** protects cutting chamber; allows instant access and increases maneuverability • **Heavy duty construction** includes coil spring, torsion-type suspension, and box tubular steel frame.

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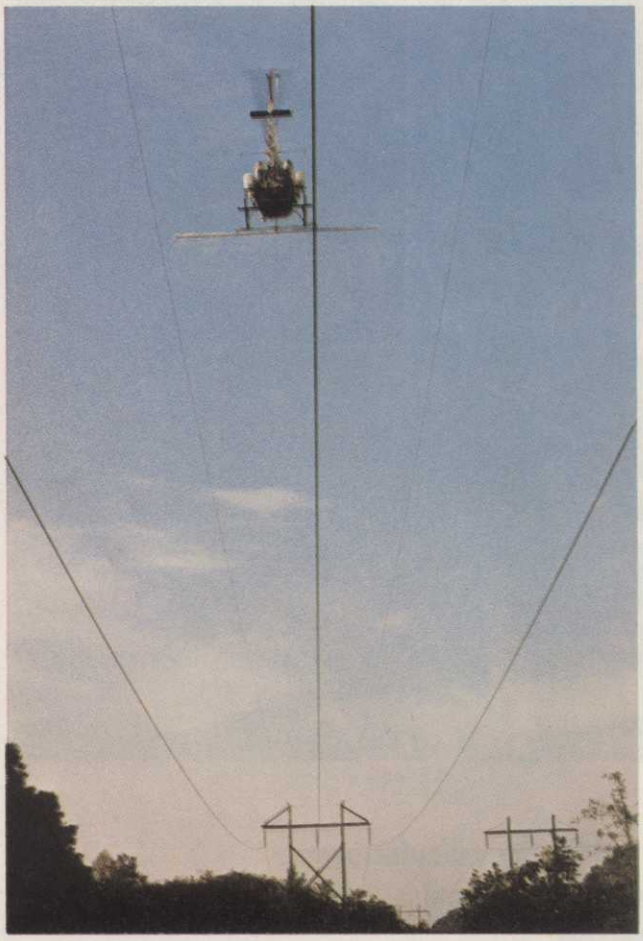
High Flying Contract Application



IT'S morning's first light. And the early silence is broken by the sound of a helicopter rotor beating the still air. It flies over the rise and down into the still dark valley followed by a sparkling stream of spray.

The pilot is a contract applicator treating vegetation beneath an electrical transmission line. His name is Jerry Hill.

Hill is president of Eastern Helicopter Corporation based in Roanoke, Virginia. He sprays many of the thousands of miles of electrical transmission and distribution cable stretched across the most rugged territory in the Eastern Seaboard states.

This eastern area has historically been a source of rights-of-way maintenance problems. Major utility companies such as Appalachian Power Co., Virginia Electric Power Co., Monongahela Power Co., and South Carolina Electric and Gas have installed their lines through areas too mountainous and swampy for economical ground crew control. Confirmed opinions from vegetation control managers indicate that ground control is not the answer. Most look to contract aerial applicators for the solution to their vegetation control problems.

Recently one utility official remarked that a tree grew into his company's electrical transmission lines. The tree caused a short-out and resulted in a breakdown of service. The outage cost this company more money then their entire contract aerial application program of nearly $160,000.

Jerry Hill is just one of many contract applicators servicing the needs of the Eastern utility companies. But outside of a few corporate-owned flying services, most are seasonal businesses operating with less than a handful of pilots. Just the nature of contract application requires extensive travel. And Hill and his ground crew travel a several state region during the 90-day spray season.

During the past spray season Hill has managed to put down over 100,000 gallons of chemicals. "By the end of this season, I'll probably have sprayed more gallons of material than I have in the four years since I started Eastern," Hill told WEEDS TREES AND TURF in September. A major percentage of Hill's high volume is a result of his efficient operating techniques.

"A pilot's ground crew can make or break any spray operation," Hill said. "My ground crew is always there with the set-ups when I land for refilling. I lose very little time on the ground."

Top: Jerry Hill steers his ship down the right-of-way applying a herbicide to the unwanted vegetation. This is the first season Hill has used the new boom and nozzle arrangement. Bottom: Hill, left, founded Eastern Helicopter Service in 1971. A major part of his success as a contract applicator is attributed to an efficient ground crew. Here Hill is shown with Charlie Turpin, center, and Bill Chappell, right, two members of his crew.

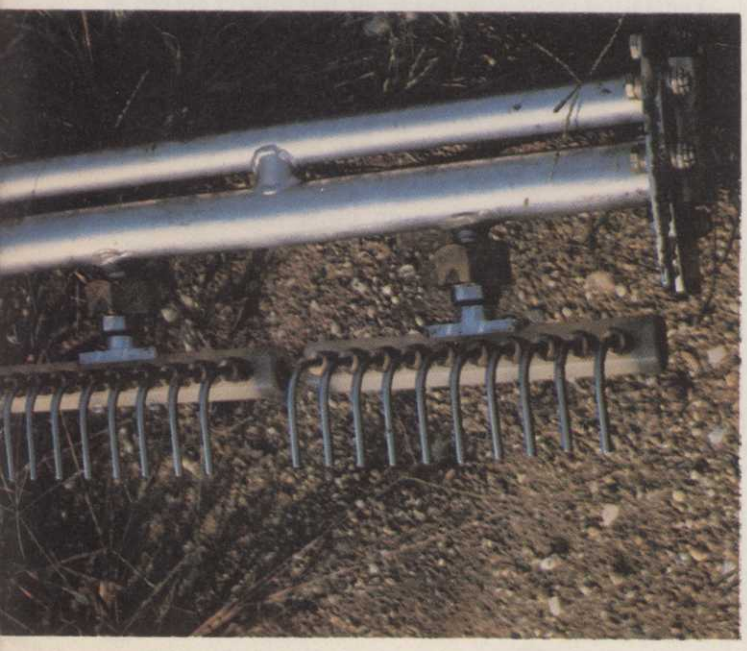
Another factor contributing to his best-ever season Hill attributes to the use of a boom and nozzle arrangement manufactured by Amchem Products, Inc., Ambler, Pennsylvania. The boom, called the Microfoil, is hardly a newcomer to the helicopter application field. "Tex" Waldrum of Amchem's Mechanical Research and Development Division pioneered the boom in 1967. Since that time, the boom has been equipped with a variety of nozzle configurations and ending, at present, with the .060 nozzle.

"The .060 refers to the orifice size in inches," said Waldrum, "That's a large droplet size compared to the earlier .013 and .028 nozzles."

Waldrum, along with several pilots using the new combination, consider it one of the most effective weapons yet for vegetation control. "The .060 produces a large droplet size giving maximum drift control and creating a shattering effect when it hits the top canopy of brush," said Waldrum. This shattering effect allows for a large part of the volume to fall through the brush giving better than average penetration and improved coverage.

(continued on page 40)

Top: *Hill demonstrated the boom and nozzle arrangement at the recent meeting of the Mountain Lake Right-Of-Way Management Council meeting near Richmond, Virginia. Here some of the members examine Hill's ship.* Lower Left: *This is a close-up view of the .060 nozzle mounted on a Microfoil boom.* Below: *The boom and nozzle produce drift control through the formation of nearly uniform droplets with a minimum of fine droplets. This results in a sheet of spray falling to the ground, rather than a drifting cloud of material.*



Microfoil Background

By "TEX" WALDRUM, Director,
Mechanical Research and Development,
Amchem Products, Inc., Ambler, PA

THE STORY of the Microfoil™ spray device actually begins shortly after World War II. At that time, the use of hormone herbicides in effective vegetation control was really coming into its own. When this hormone herbicide began to be used commercially, it became apparent that drift control, especially in aerial application, would be very important for effective use.

Amchem Products, Inc. (known as American Chemical Paint Company at that time) held patents on 2-4D and were immediately aware of the drift control problem and how important a solution would be. In those days, scientific thinking was oriented around the use of thickened carriers which would produce larger droplets than conventional spray . . . and reduce drift in this way. With this concept in mind, Amchem developed invert emulsion.

Everyone agreed that this should be an extraordinary drift control material. But, there was no spray equipment available which was capable of handling the invert . . . even on an experimental basis. The problem was assigned to Amchem mechanical research and development. The result was invention of a device now known as the Spra-Disk™.

The Spra-Disk is a centrifugal device for aerial application which sprays through 360° and is capable of handling invert emulsions at their maximum viscosity. For 15 to 17 years this device was a leading development where precise drift control was needed in aerial application of industrial chemicals. It became the mainstay of helicopter industrial application east of the Rocky Mountains.

Through these years, while taking advantage of the invert emulsion system, technical and scientific personnel were increasingly aware that further advances needed to be made. Invert emulsion was an added economic burden, for one thing.

The consensus was that conventional spray would be the answer, if a device could be conceived to eliminate or drastically reduce the drift of material during application. The Microfoil aerial applicating spray device was the result.

Microfoil controls drift by using surface tension to manufacture uniform droplets from a laminar flowing stream. The process allows all droplets making up the pattern to be virtually uniform in size — preventing segregation of droplets due to cross wind conditions and eliminating aerosol. With the precise spray pattern it is possible to make drops from whatever height necessary and still apply all spray material on target. □

APPLICATION *(from page 39)*

But the Waldrum development has done more than improve the chemical coverage. It has allowed pilots to apply more chemical in a single pass over the right-of-way. "During the first days of rights-of-way maintenance, all control was accomplished from the ground," Hill added. "Now with this new nozzle and boom arrangement, my application rates have increased to 25 gallons per acre under optimum conditions." Hill claims the increased rate attains and surpasses any control from the ground.

And according to Hill, aerial application at these new rates is cheaper than ground control. "Side-trimming is one of the most difficult control operations to perform from the ground, Hill says, but it's a relatively simple job with a helicopter and Microfoil." "The boom does a better job with an .060 than can be done from the ground, considering the type and ability of the pilot versus the ground crew."

Hill describes his airborne ship and boom as a very precise instrument. "A pilot can write his name with this boom," he said. But a precision instrument is only as good as the operator. And pilot finese has become the name of the game.

The chemical application business is being bombarded from all sides by government agencies, a variety of citizen organizations, and the media. The negative publicity has done nothing to lessen the number of complaints or damage claims. "A pilot has to be extremely careful when spraying chemical," Hill added. "You have to maintain a stable ship and keep the spray on target."

Vegetation control from the air has always stayed in the 90 percent area, says Hill. But with the extra volumes of chemical pilots are now able to put down, control has been reported at almost 100 percent. Once the pasture-like appearance has been achieved in the rights-of-way, the unwanted woody growth is easier to keep under control.

The maximum spray season using phenoxy herbicides is approximately 90-days for most eastern areas. But one new chemical recently introduced to the rights-of-way market may extend the season by an additional 30 days. The product is called Krenite. It's manufactured by DuPont. "Krenite doesn't cause the unsightly brownout found with most of the herbicides," said Hill. "It's especially useful around roadsides and crossings where the public has a first-hand view."

An old crop duster once said that airplanes were made to fly and helicopters were made to crash. But then he never met Jerry Hill. The 35-year-old pilot has been in air for a dozen years and with his precise control and thorough ship maintenance he'll be in the air for another dozen. □

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When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

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U. S. Forest Service will present seeds from specially bred superior quality trees, including a Serbian spruce hybrid, to the crews of the Appollo/Soyuz space flights. The seeds are intended for planting in hometowns of the astronauts and cosmonauts.

The Outdoor Power Equipment Institute told the Consumer Product Safety Commission that the proposed power mower standards would increase prices $368 million in higher mower prices during the initial year, hurt sales, put a number of manufacturers out of business, and impose costs 10 times higher than any benefits. The Institute said the walk-behind power mower that the operator has to push would be priced 40 percent above its average 1975 retail price if the standards are adopted. Similarly, the self-propelled, manual start, walk-behind unit would increase 28 percent. The manual-start riding mower would go up 17 percent.

Where the two organizations differ, though, is in the cost of injuries. Based on a report conducted by Stanford Research Institute, the Outdoor Power Equipment group told the Consumer Product Safety Commission that mower accidents cost the public $35 million per year in medical expenses, lost wages and other direct expenses.But the Commission estimated a much higher economic toll—$48 million to $413 million per year when the cost estimates don't include suffering, and $111 million to $775 million when they do. The Commission hopes to complete its deliberations and formally propose the mower standard by February.

"Operating Cost Survey", third in an Associated Landscape Contractors of America (ALCA) survey series, has been compiled by Ernst and Ernst. The survey profiles union and non-union, as well as small, medium and large landscape contracting firms. The survey also depicts industry averages in such categories as equipment rental, direct materials, accounting and legal fees, selling expense, average days of receivables, executive compensation, percent return on net worth and average unsecured line of credit. Cost of the survey to non-ALCA members is $25 per copy and members may purchase additional copies at $3 per copy. Write ALCA, 1750 Old Meadow Rd., McLean, Virginia 22101.

First sighting of Gypsy Moth in Arkansas was reported this summer. However, the insect was trapped in a tourist campground and it is not known whether the moths emerged from a local infestation or from an egg mass transported on a tourist vehicle. Additional traps were immediately set in the area and the trapping season extended to help determine the origin of the trapped moths.

The Toro Company has become a member of the special committee for U. S. Exports. The committee, formed by American industry to increase U. S. employment through expanded exports, is working to protect Domestic International Sales Corporations (DISC) from attack from some members of Congress who charge they are "revenue drains."

National Golf Foundation statistics show that there are 4,802 regulation 9-hole golf courses in the nation compared to 5,653 regulation courses of 18 holes or more. The count is even closer when executive and par-3 courses are added, swelling the totals to 6,344 9-hole layouts compared to 6,452 courses of 18 holes or more, a difference of only 108 courses. In 25 states, 9-hole regulation courses out number those of 18 holes or more. North Dakota, for example, has 78 nines compared to only 10 full length courses. In South Dakota, the difference is 82 and 12, in Maine 68 and 26, in Arkansas 81 and 48, in Oklahoma 94 and 53, in Nebraska 116 and 35, and in Iowa a whopping 244 to 64. Even those states with a preponderance of full length courses also have an abundance of 9-hole regulation courses. New York lists 243, Michigan 245, and Texas 282.

The Fourth Legislative Conference for state and regional association executives and legislative chairmen has been set for December 16-17, at the Fairmont Hotel, New Orleans, La. The conference, sponsored by the American Association of Nurserymen, is designed to deal primarily with state legislative problems, such as taxation, labor laws, OSHA, license laws, etc.

Dr. R. L. Miller, Ohio State University entomologist, discusses life cycle, injury symptoms, and timing of insecticide applications for control of common turf insect pests. However, one not-so-common pest that plagued localized Midwest turf areas this summer was the Ateanius grub. Miller spoke at the Ohio Turfgrass Field Day in Columbus. For the complete story see page 25.

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